JULY
1961
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35¢

AMERICAN Cinematographer

The Magazine of Motion Picture Photography

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- Filming The Fastest Flyer
- Assignment In An Asphalt Jungle
- Shooting A Film On Soldering Techniques

" 'Superior'® 2 film has enormous potential under so-called 'impossible' conditions"

says William K. McClure, a cameraman for "CBS Reports," currently on assignment in Britain.

"The one impressive result from using 'Superior' 2 is its ability to capture detail and highlights despite overcast skies and mucky weather. This latitude helps in shooting documentaries where elaborate lighting setups are impossible, but where high quality and low grain reproduction are desired.

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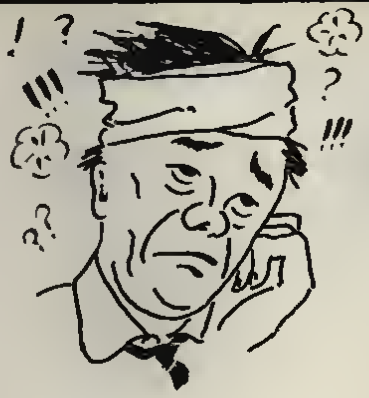

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ON THE COVER

SHOOTING CLOSEUP of an area ¾" in width for "On Solder," commercial film on industrial soldering techniques. From left are Director Ron Hagerthy, soldering technician Chuck Meier, and cameraman Joseph V. Mascelli checking scene through viewfinder of the Arriflex 16. Meier's hands are wrapped in wet towels to prevent burning by intense heat from lights.

AMERICAN CINEMATOGRAPHER, established 1920, is published monthly by the A. S. C. Agency, Inc., 1782 N. Orange Dr., Hollywood 28, Calif. SUBSCRIPTION: United States and Canada $4.00 per year, Foreign, including Pan-American Union $5.00 per year. Single copies 35 cents; back numbers 45 cents; foreign single copies, 45 cents; back numbers 55 cents. Advertising rates on application.

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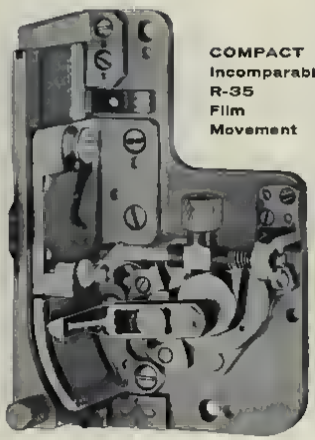

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INDUSTRY NEWS

News briefs of industry activities, products and progress

Florman & Babb To Repeat Animation Seminar

Florman & Babb, Inc., New York, N. Y., will again conduct a four-day seminar on animation techniques at its headquarters on West 45th Street. Dates for seminar sessions, undisclosed up to press time, will be held within the next few weeks. About 250 persons can be accommodated and those interested are requested to make application to Mr. Charles Lipow, Workshop-Seminar Coordinator, Florman & Babb, Inc., 68 West 45th St., New York 36.

The program, according to Lipow, will include talks and discussions by prominent animation experts on different aspects of animated film production. There will be practical workshop demonstrations and practice sessions utilizing latest types of representative animation equipment.

* * *

ASC Activates Research and Education Committee

A significant step taken last month by the American Society of Cinematographers brought Walter Beyer into the organization to chairman the Society's newly-established Research and Education Committee. Beyer, who is head of the Engineering Research Department at Universal-International studios in Hollywood was formerly a staff engineer with the recently disbanded Motion Picture Research Council. In recent months, he has worked with U-I engineers in setting up correct projection facilities in major theatres throughout the nation for screening U-I's 70mm wide screen spectacle "Spartacus."

According to William Daniels, President of the ASC, the Research and Education Committee will widen the scope of the Society's activities through inter studio research and development similar to that which was carried on by the Research Council. The files and technical data of the defunct Research Council, until now available only to those studios which were sustaining members of the Council, will now be made available also to the ASC's Research Committee. The new Research setup will not involve the ASC in adding any paid personnel and no large research expenditures are contemplated at present.

The Committee reportedly will work closely with all Hollywood studios, related industries and technical specialists active in the industry, and disseminate information on newest technical trends, equipment, etc. It will also handle the exchange of technical information between different departments of the major studios with the object of aiding in the solution of production problems and improving procedures pertinent to day-to-day studio operations.

Hal Mohr, a member of the ASC's Board of Directors, has been appointed Co-chairman of the ASC Research and Education Committee. Other Committee members are cinematographers Gordon Avil, Mark Davis, Robert Hoag, Winton Hoch, Wallace Kelley, Harold Lipstein, and George Folsey, also Douglas Shearer, technical engineer at MGM, and Ray Johnson, head of MGM's camera department.

* * *

Data Released On Ansco's New High-speed Color Film

Ansco, last month, received government clearance to release basic information on the special Ansco color film used in documenting Lt. Commander Alan B. Shepard's historic space flight May 5th in the dimly-lighted Mercury capsule.

This 16mm film, which recorded Astronaut Shepard's reactions during the flight, is the fastest color film yet produced. Anscochrome PFC-132 was developed specially for the space program. More than nine months' research and test preceded the film's use during the flight. Plans call for offering it for the benefit of all industry in the near future.

In addition to its already-proven usefulness in missile and space research and operations, the new film, according to Ansco, has a wide range of potential application in industrial research such as flame study, instrumentation, and other specialized applications where high speed and reliable color fidelity are a necessity. Although the film is presently rated at a minimum of ASA 200, Ansco's experiments have indicated that a much higher rating, up to

Continued on Page 390

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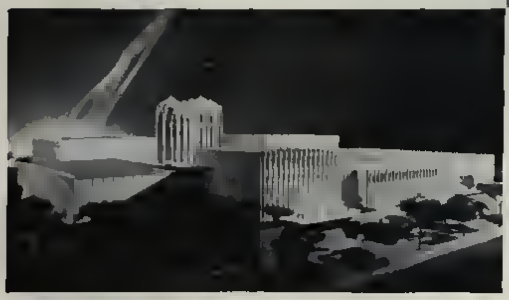
A motion picture production center for the government of Pakistan! Reevesound planned and provided the complete design, equipment, technical facilities—and installed them. In addition, Reevesound supplied personnel and training to get the studio on its feet!



Breaking the presentation barrier!
The Federal Science Pavilion at the Century 21 Exposition in Seattle will feature a revolutionary multiple image projection system (seven projectors are employed). Designed especially by Reevesound for the U.S. Department of Commerce. The system will show a highly imaginative film presentation created by famed designers Charles and Ray Eames who worked closely with Reevesound engineers.

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INDUSTRY NEWS

Continued from Page 388

ASA 500, is acceptable because of the film's consistently good latitude, which permits wider use of smaller lens openings without the necessity of forced processing. With forced processing (essentially overdevelopment to compensate for underexposure) the film's speed range may be extended even further.

Anscochrome FPC-132 is essentially a daylight type film (6000°K), but may be used under tungsten illumination in special cases. Like other color films, the speed of FPC 132 is considerably reduced by the filters required when it is used under artificial light. For this reason, Ansco recommends the use of Super Anscochrome Tungsten type under these conditions.

The new film has excellent color reproduction qualities from highlights to the deepest shadows. Its wide latitude permits variations of plus or minus ½ lens stop for full color quality and up to 1 full lens stop for applications where data acquisition is the requirement.

Grain of the FPC-132 is of moderate size and gradation is similar to that in Super Anscochrome. Resolution is between 45 and 55 lines per mm. The film will be supplied in 16mm, 35mm, and 70mm widths. The 16mm film will be supplied in high speed perforation (2R 3000); the 35mm in negative perforation (B&H 1870) and high speed (KS1870), and the 70mm in Type I and Type II. Base of the film is safety type with the anti-halation layer between the base and emulsion removed during processing. Availability of Super Anscochrome for general industry use will be announced shortly, according to Ansco.

* * *

New, High-sensitivity Meter

A new exposure meter designed to keep abreast of today's new high-speed films that permit shooting under extreme low-level light conditions, is announced by Photo Research Corp., Hollywood. Trade named the Spectra "Combi-500", the new, ultra-sensitive meter possesses a sensitivity 500 times greater than that of conventional selenium cell meters and 100 times more than the company's highly-sensitive Spectra Professional meter. The high-sensitive factor is the result of a combination of a selenium photocell plus a newly-developed photo-conductive cell augmented by a tiny, easily-accessible mercury battery which functions only when exposure readings are to be taken in the ultra-sensitive range.

Photo Research also announces it is prepared to convert any earlier-model Spectra Professional meters to the new ultra-sensitive type at nominal cost. ■

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- ☐ 66 ft rolls — transparent 35mm (T-35) at $11 00
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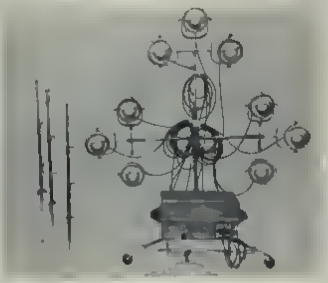


Explosion-proof Lighting

Developed originally for use in the government's Missile Program is an integrated, explosion-proof ColorTran lighting system for photography by Natural Lighting Corporation, 630 So. Flower St., Burbank, Calif. The "package" (pictured above) consists of 9 explosion-proof lighting units which take rugged PAR-64 lamps; two ColorTran CineMaster converters in explosion proof housings; plus a sturdy "Xmas-tree" stand. Equipment is also ideally suited for use in military, instrumentation and industrial motion picture production.

Special Groundglass Marking

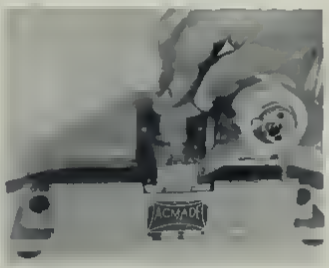
Among the specialized services offered by Bryhn Camera Service, 6304 Melrose Ave., Hollywood 38, Calif., is the scribing of center cross-hairs and TV aperture markings on the viewer groundglass of Arriflex 16 cameras. Company is prepared to meet requirements of professional cameramen who desire precise reference marks for television cut-off and frame center lines for title, trick and special effect photography. It points out that the Arriflex camera's unique 45-degree mirror-shutter and angled optical system is substantially improved when the camera's groundglass is individually marked and positioned.

Battery Power Pack

Gordon Enterprises, 5362 Cahuenga Blvd., No. Hollywood, Calif., offer a nickel-cadmium battery pack having a capacity of six to ten hours. Trade-named the Dynafax Power Pack, the lightweight DC source was designed especially for powering a wide range of motion picture cameras, tape recorders, and data recording instruments. Unit is available with either 12- or 24-volt outputs and there is also a model for Arriflex cameras that supplies either 8.5 volts or 17 volts. All models are housed in sturdy leather case with shoulder strap. A companion unit is a charger which operates from 115-volt current.

Super-telephoto Lens

Birns & Sawyer Cine Equipment, 6424 Santa Monica Blvd., Hollywood 38, Calif., announces a 1000mm Omnitar telephoto lens adaptable to most 16mm, 35mm and 70mm motion picture cameras. Lens has an angle of view of 3°, focuses from 67' to infinity, and has maximum aperture of f/6.3. Lens may be used with Cine Special, Fastax, Mitchell, and Nikon Reflex cameras with special adapters. Also available is a specially designed supporting base. Weight of lens is 14 lbs., 4 ozs. List price is $795.00.



Film Splicer

Florman & Babb, Inc., 68 West 45th St., New York 36, N.Y., is U.S. distributor for the British-made Acmade automatic film splicer which employs Mylar perforated tape to make butt-splices in 16mm and 35mm film. The splicing tape is registered on precision sprocket pins and held in place until automatically applied to the film—an operation accomplished by swinging the splicer arm over and pressing it in place. Literature is available.

Magnetic Striper

SOS Photo-Cine-Optics, Inc., 602 West 52nd St., New York 19, N.Y., announces the new Sonocolor magnetic sound striping equipment which applies striping to motion picture film of all sizes. Changeover time from one film size to another is short. Equipment will apply full coating, single or multiple tracks in one operation. Track

Continued on Page 394

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What do these leading firms have in common? They all have "in-plant" film departments...they all own Arriflex cameras!

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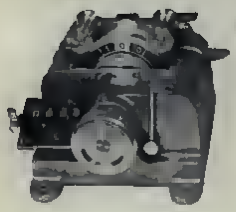

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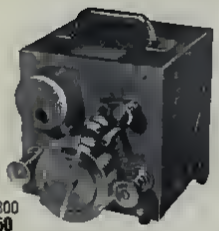

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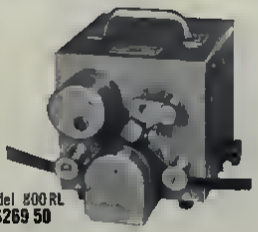

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Model 600 RL
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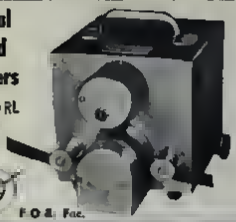

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WHAT'S NEW

Continued from Page 392

uniformity is assured through micrometer adjustment. One man can operate the Sonocolor which is capable of striping 1800 to 3000 ft. of film per hour. Completely self-contained, it requires less than 11 square feet of floor space. List price is $8,995.00, FOB New York.

W/A Prism Camera Lens

Triad Corporation, 17136 Ventura Blvd., Encino, Calif., announces a wide-angle lens for use with prism cameras. Designated the Traid 120 lens, it has a 165° angle of view and is especially adaptable for use with the Photo Sonics 16mm-1B high speed motion picture camera. Color-corrected for daylight Kodachrome and properly coated, the lens is provided with both clear and haze filters, has a focal length of 3.53mm, a speed of f/1.9 with stops ranging up to f/16, and weighs just over 2 lbs. Diameter is 3.20" and length 5.86". Complete data sheet is available from Traid Corp.

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Carter Mfg. Co., 1229 S.E. Division St., Portland, Oregon, is leading manufacturer of car-top platforms for photographers. Company's popular line of Car Pac platforms are constructed of polished aluminum and spar-varnished hardwood. Total deck area is over 22 sq. ft. Prices, $165 to $225. ■

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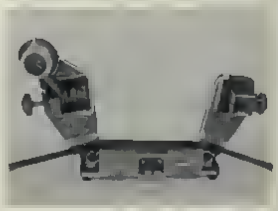

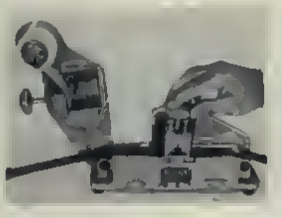

The cutting arm shown in operating position, is used by pressing the chrome button for cutting both sides of the film simultaneously The film, of course, has been registered on pins in the horizontal channel The cutting blade is easily replaced when necessary

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- ☐ 66 ft rolls — transparent 35mm (T-35) at $11 00
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CASCADE STUDIO

ROY SEAWRIGHT, Commercials*

HENRY SHARP, ASC Commercials*

TYLER BYARS, Commercials*

NORBERT BRODINE, ASC, Commercials*

COLUMBIA STUDIOS

FRED YOUNG, "Lawrence of Arabia" (Super Panavision 70 & Technicolor, Horizon American Prods., shooting in Jordan) with Peter O'Toole. David Lean, director.

CHARLES WELBORN, "The Three Stooges Meet Hercules" with the Three Stooges and Vicki Trickett. Edwards Bernd, director

FRED GATELY, ASC, "The Hathaways"*.

GERT ANDERSEN, ASC, "Danaa Reed Show"*

JACK MARTA, "Route 66"*

GUISSEPPE ROTUNNO, "Two Enemies" (Dino de Laurentiis Prods., shooting in Israel) with David Niven and Albert Sordi Guy Hamilton, director

ALDO TONTI, "Barabas" (Technirama 70 & Technicolor, Dino De Laurentiis Prods., shooting in Italy) with Anthony Quinn and Silvano Mangano Richard Fleischer, director

JOE MACDONALD, ASC, "Walk on the Wild Side" (Famous Artists Prods.) with Laurence Harvey and Capucine Edward Dmytryk, director

CHARLES LAWTON, JR., ASC, "The Tiger Among Us" (Ladd Enterprises, Inc.) with Alan Ladd and Rod Steiger Philip Leacock, director

JOE BIROC, ASC, "Sail a Crooked Ship" (Philip Barry Prods.) with Robert Wagner and Dolores Hart. Irving Brecher, director.

ANTHONY HELLER, "On the Brink" (Hammer Film Prods., shooting in London) with Macdonald Carey and Shirley Ann Field. Joe Losey, director.

ARTHUR ARLING, ASC, "Notorious Landlady" (Kohlmar-Quine Prod.) with Kim Novak and Jack Lemmon Richard Quine, director.

DESILU—Gower

ROBERT PLANCK, ASC, "My Three Sons."*

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JAMES VAN TREES, ASC, "Dobbie Gillis"*

FILMWAYS STUDIOS—New York

MORRIS HARTZBANO, "The Defenders"* (CBS) Boris Sagal and Buzz Kulick, directors.

GENERAL SERVICE STUDIOS

THOMAS TUTWILER, ASC, Commercials*, "International Golf Show"*

INDEPENDENT

CARL GUTHRIE, ASC, "X-15" (P-Vision Technicolor) Essex Prod for UA) with Charles Bronson and Brad Dexter, director

JACK BOHRER, "Flight of the Last Balloon" (Woolner Marquette-Juran Prods., shooting in Puerto Rico) with Mala Powers and Marshall Thompson. Jerry Juran, director

FRANK PLANER, ASC, "Infamous" (Wm Wyler Prod.—Mirisch Co., UA release) with Audrey Hepburn, Shirley MacLaine and James Garner William Wyler, producer-director.

GILBERT WARRENTON, ASC (Harvard Film Corp.) "Secret of the Deep Harbor" with Ron Foster and Merry Anders, "Vendetta of a Gunfighter" with James Brown and Jean Willes Edw L. Cahn, director

WINTON HOCH, ASC, "Badlands" (Essex prods for UA, shooting in Kanab, Utah) with Frank Sinatra and Dean Martin John Sturges, director.

TED MCCORD, ASC, "The Land We Love" (Daystar Prod.; UA release, P'Vision & Color, shooting at Catalina) with James Mason and Kate Manx Leslie Stevens, producer-director

RICARDO TORRE, "The Magic Fountain" (C-Scope & Eastman color, shooting in Madrid) with Fernando Lamas and Esther Williams. Fernando Lamas, director

ALEX PHILLIPS, "Geronimo" (Panavision & Technicolor, Levy Gardner-Laven Prod for UA) with Chuck Connors and Kamala Devi. Arnold Laven, director

ELWOOD J. NICHOLSON, "The Phantom Planet" (Four Crown Prods., shooting at Producers Studio) with Dean Fredricks and Coleen Gray Bill Marshall, director

ERNEST LASZLO, ASC, "Judgment at Nuremberg" (Stanley Kramer Prods for UA release) with Spencer Tracy and Burt Lancaster. Stanley Kramer, director

ROBERT KRASKER, "El Cid" (Super Technirama 70, Samuel Bronston Prods. with D.E.A.R.; Films for Allied Artists & J. Arthur Rank, shooting in Spain) with Charlton Heston and Sophia Loren Anthony Mann, director.

MARIO MONTUORI, "Last Days of Sodom and Gomorrah" (Embassy Pictures-Titanus, Eastman color; shooting in Morocco) with Stewart Granger and Pier Angeli. Robert Aldrich, director

WILKIE COOPER, "The Valiant" (C'Scope; B H P Inc for UA; shooting in Italy & London) with John Mills and Ettore Manni. Roy Baker, director.

ROBERT BRONNER, ASC, "Pocketful of Miracles" (P'Vision & Consolidated color, Franton Prods. for UA) with Glenn Ford, Bette Davis and Hope Lange Frank Capra, director.

HOWARD SCHWARTZ, "A Public Affair" (Girard-Lewis Prod., shooting in Sacramento) with Myron McCormick and Edw Binns. Bernard Girard, director

METRO-GOLDWYN-MAYER

JOHN NICKOLAUS, "Rawhide"*

GEORGE CLEMENS, ASC, "Twilight Zone"*

HAL MOHR, ASC, "Father of the Bride"*

JOSEPH LA SHELLE, ASC, "How the West was Won" (Episode 3; Cinerama) with John Wayne and Carroll Baker.

Continued on Page 399

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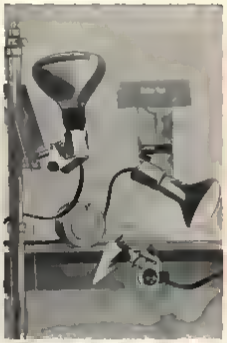

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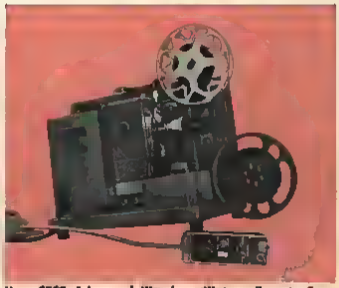

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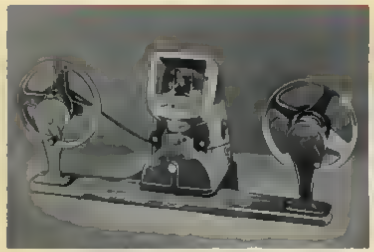
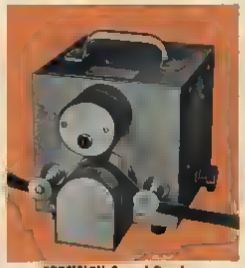


MOVISCOP 16mm Film Viewer



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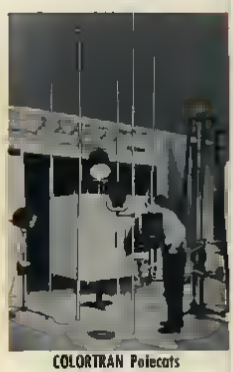

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BEHIND THE CAMERAS

Continued from Page 396

METRO-GOLDWYN-MAYER

CHARLES LANG, ASC, "How the West was Won" (Episode I, Cinerama, color, shooting in Paducah, Ky.) with James Stewart and Debbie Reynolds. Henry Hathaway, director.

ROBERT SURTEES, ASC, "Mutiny on the Bounty" (Ultra Panavision & Color; shooting in Tahiti, Arcola Prods.) with Marlon Brando and Trevor Howard. Lewis Milestone, director.

JOSEPH RUTTENBERG, ASC, "Bachelor in Paradise" (C'Scope & Color, Ted Richmond Prods.) with Bob Hope and Lana Turner. Jack Arnold, director.

PARAMOUNT STUDIOS

WALTER CASTLE, ASC, HASKELL BOGGS, "Bonanza"*

HAROLD LIPSTEIN, ASC, "Hell is for Heroes" with Steve McQueen and Bobby Darin. Don Siegel, director.

RUSSELL HARLAN, ASC, "Hatari!" (Howard Hawks Prod., Technicolor, shooting in Africa) with John Wayne and Gerard Blain. Howard Hawks, producer-director.

CHARLES LANG, JR., ASC, "Blue Hawaii" (Panavision & Technicolor) with Elvis Presley and Joan Blackman. Norman Taurog, director.

PARAMOUNT SUNSET STUDIOS

FLEET SOUTHCOTT, "Gunsmoke"*

REPUBLIC STUDIOS

ERNEST HALLER, ASC, "Married Too Young" (Headliner Prod.) with Harold Lloyd Jr. and Jana Lund. George Moskov, director.

WILFRID CLINE, ASC, "Robert Taylor Detectives"*

GEORGE DISKANT, ASC, CHARLES BURKE, "Dick Powell's Zane Grey Theatre"*

PAUL IVANO, "The Nun and the Sergeant" (Eastern Film Prod., UA release) with Robert Webber and Anna Sten. Franklin Adreon, director.

HOWARD SCHWARTZ, "The Case of Patty Smith" (Impact Prod.) with J. Edward McKinley and Joe Conley. Leo H. Handel, producer-director.

BYRDON BAKER, "San Angelo" (Pen Gem Prod.) with Marty Ribbins and Joyce Redd. Bill Ward, director.

REVUE STUDIOS

JOHN RUSSELL, ASC, "Tall Man"*

BENJ. KLINE, ASC, JOHN RUSSELL, ASC, "The Investigators"*

ELLIS THACKERY, ASC, "Wells Fargo"*

BENJ. KLINE, ASC, "Frontier Circus"*

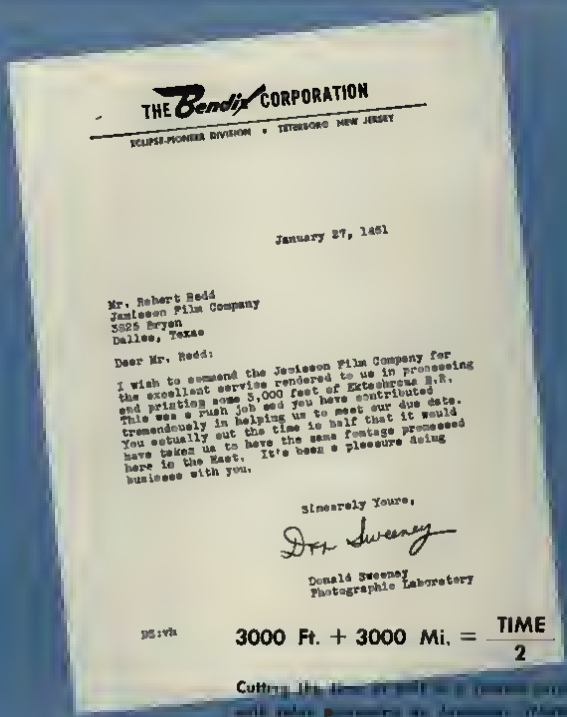
LIONEL LINDON, ASC, Commercials*

SAM LEAVITT, ASC, "Cape Fear" (Melville Prods.) with Gregory Peck and Robert Mitchum. J. Lee Thompson, director.

MACK STENGLER, ASC, "Leave it to Beaver"*

NOTE:

The commercial and television productions in the listings in these columns are indicated by asterisks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BEHIND THE CAMERAS

Continued from Page 399

REVUE STUDIOS

Russell Metty, ASC, "Flower Drum Song" (Panavision, Ross Hunter Prod.) with Nancy Kwan and James Shigeta. Henry Koster, director

Walter Strenge, ASC, "Wagon Train"*

Ray Rennahan, ASC, "Laramie"*

Philip Lathrop, ASC, "The Last Hero" (Panavision, Joel Prod., shooting in N. M.) with Kirk Douglas and Gena Rowlands. David Miller, director

TWENTIETH CENTURY-FOX

Floyd Crosby, ASC, "The Five Fingers of Death" (C'Scope, API) with John Agar and Paula Raymond Gene Nelson, director

Ellis Carter, ASC, "A Star in the West" (C'Scope & DeLuxe color) with Debbie Reynolds and Ken Scott. Vincent Sherman, director

Daniel Fapp, ASC, "Bachelor Flat" (C'Scope & DeLuxe color) with Richard Beymer and Tuesday Weld Frank Tashlin, director

Lloyd Ahern, ASC, "Adventures in Paradise"*

Leon Shamroy ASC, "Tender is the Night" (C'Scope & DeLuxe color, shooting in France) with Jennifer Jones and Jason Robards, Jr Henry King, director

WALT DISNEY STUDIOS

Edward Colman, ASC, "Babes in Toyland" with Ray Bolger and Tommy Sands Jack Donohue, director

William Snyder ASC, "Moon Pilot" with Tom Tryon and Brian Keith James Neilson, director

WARNER BROS

Glen MacWilliams, ASC, "Cheyenne"*

Ray Fernstrom, ASC, Lewis Jennings, "Bronco"*

Robert Tobey, ASC, Ray Fernstrom, ASC, Carl Guthrie, ASC, Jack Marquette, "77 Sunset Strip"*

Robert Hoffman, Burt Glennon, Robert Tobey, ASC, Glen MacWilliams, ASC, "Hawaiian Eye"*

Ralph Woolsey, ASC, "Roaring Twenties"*

Carl Berger, ASC, Lewis Jennings, Robert Hoffman, "Surfside 6"*

Arthur Feindel, ASC, Commercials*

Robert Burks, ASC, "The Music Man" (Technirama & Technicolor) with Robert Preston and Shirley Jones Morton DaCosta, producer-director

Burt Glennon, "Lad: A Dog" with Peggy McCay and Peter Breck. Aram Avakian, director

Ralph Woolsey, ASC, Burt Glennon, "Lawman"*

Harry Stradling, ASC, "A Majority of One" (Mervyn LeRoy Prod.) with Rosalind Russell and Alec Guinness. Mervyn LeRoy, producer director.

Harold Stine, ASC, "House of Women" with Shirley Knight and Andrew Duggan. Walter Doniger, director

ZIV-UNITED ARTISTS

Brick Marquard, "Sea Hunt"*

Monroe Askins, "Rip Cord"*

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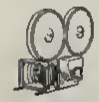

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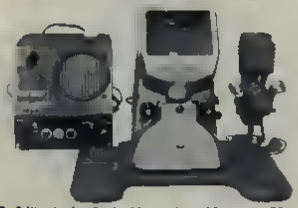

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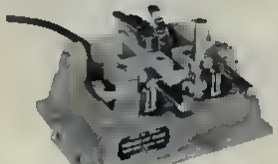

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Q & A

Technical Questions and Answers

Q.—*I will be tackling a major underwater shooting assignment next month in Florida waters. Would appreciate advice on best lens to use for such work with respect to focal length. Also advice if results can be improved by use of filters and, if so, which ones—A. H. H., Newark, N. J.*

A.—Because of the problem of refraction that you will encounter, and also because you should always work as close to your underwater subject as possible in order to keep the volume of water between camera and subject at a minimum, a wide-angle lens (18.5mm for 35mm cameras and 10mm to 13mm for 16mm cameras) will provide greater depth of field and at the same time a wider picture area. With lens set at the hyperfocal distance, focusing problems are eliminated and sharpness assured.

As for use of filters, a K-2 or a G may be used to advantage underwater with panchromatic film. Either one will produce the same relative effect as when it is used in normal above-water cinematography. However, underwater, the factor for these filters increases since they absorb a higher percentage of the available light, which you will find to be predominantly blue-green.

Some cinematographers, when preparing to shoot under water with a filter over the lens, first determine the working exposure by taking a reading of the light with the filter placed over the meter's photocell window. The light reading thus obtained is the norm for the existing light minus the amount of light absorbed by the filter.

Q.—*In a recent article, reference was made to "A & B" rolls in connection with editing a film. Elsewhere I have seen the reference "A-B rolls," and "A, B, C, rolls." Will you please explain these terms and what they mean?—O. A. N., Philadelphia, Pa.*

A.—The terms refer to the procedure of film cutting which eliminates splice images in the final print. In A-B roll cutting, rolls of original film, or other film which is to be edited, are prepared for printing in synchronized form with the aid of a "synchronizer" having two or more film channels. Both rolls begin with appropriate leaders; thereafter the A roll is assembled, composed of a selected scene followed by opaque leader, followed by another scene, and so on. The B roll begins with opaque leader opposite first A roll scene, and alternates scenes are cut in opposite opaque leaders in A roll.

When the lab makes the final print, the A and B roll scenes are printed alternately—the printer operating via a cue system to effect this alternate printing so that there is no splicing of scenes required in the original and thus none shows in the print. The A-B method also is used where lap-dissolves, wipes and other effects are to be produced in the printing. Sometimes A-B roll editing also involves a C roll and a D roll, depending on the cutting requirements, this explains why you have seen the method referred to variously as "A&B roll," "A-B roll," "A-B-C roll," etc.

The method is thoroughly but concisely explained in a chapter in a new book, "Motion Picture Production For Industry," reported elsewhere in this issue. Additional information and descriptive charts are also available from the Association of Cinema Laboratories, 1226 Wisconsin Ave., N.W., Washington 7, D.C. ■

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★ CAMERAS, 16MM

BOLEX H 16 SUPREME 17mm f2 7 lens; filter slot; filter holders $149 50

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PHOTO RESEARCH Spectra Meters with filters sphere case 2 Color $129 50

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PAKO Heat Exchangers controls solution temperatures accurately $300 value New (Surplus) $98 50

FRIED Light Scene Tester, 1 to 11 exposures As is $99 50

EASTMAN Electric 35mm Film Waxing Machine with heating element and motor Originally $1500 Rebuilt $495 00

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CINE SPECIAL ANIMATION Motor New $259 50

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TEL-ANIMASTAND, art table N/S/E/W, rotary movement New demonstrator $3000 value $1795 00

B&H 35mm Animation Camera 400' magazine dissolve $3500 original cost $1250 00

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★ MOTION PICTURE PRINTERS

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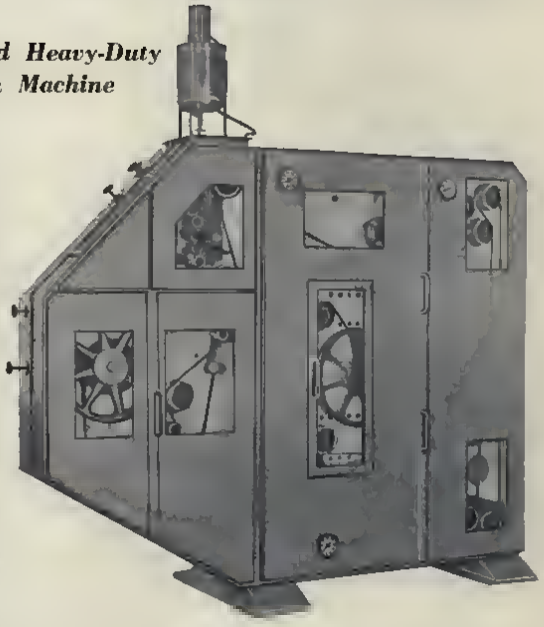

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NEW BOOK REPORTS

Motion-picture Production for Industry, *by Jay E Gordon. The Macmillan Company, 60 Fifth Ave., New York 11, N.Y $8 00*

This book is intended as a source of guidance for the man or woman responsible for performing one or more of the many assignments in the often complicated task of producing an effective film As the author points out in the preface, "although it is aimed primarily at in plant film-production operations, the book's application does not end there Much in these pages will be of assistance to the commercial film producer who is engaged to make a film in an industrial plant and to the student who elects to follow a course leading to industrial film production"

The book is not a treatise on art; nor is it a specialized book on camera technique It is a complete guide to the successful operation of a film department The author offers specific suggestions for coping with the large and small problems encountered every day He brings many years experience as an industrial film maker to the writing of this book. The procedures he outlines for preparing, producing, and distributing motion pictures have been proven in practice

For the management person concerned with a new program of film, *Motion Picture Production for Industry* answers many practical questions· How large a film staff do you need? How should you budget your film money? Should you buy or rent equipment? How can work forms be designed for maximum effectiveness?

For the film maker, author Gordon delves into such matters as choice and use of equipment, recruiting of actors, when to use animation, techniques of aerial photography, missile photography, promotion of your films and the role of the film library

Helpful chapters detail film coding, editing, direction, camerawork, and acting for the documentary film A 20-page glossary of vital film terms is included.

The author, prior to his untimely death in an automobile accident, was Supervisor of Motion Pictures and Audio-Visual Aids for North American Aviation, Inc., Autonetics Division, and was a past-president of the Industry Film Producers Association

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Television In The Public Interest, *by A William Bluem, John F. Cox, and Gene McPherson Hasting House Publishers, 151 East 50th St., New York, N Y $6.95.*

To serious photographers and producers of motion pictures, television is both ally and competitor The progress, innovations and technical developments of the medium are therefore of continuing interest to those whose business or avocation is making motion pictures

This book provides practical information and advice on an area almost totally neglected heretofore in the literature of television—how the layman may make better use of the TV medium for public service causes and projects

Aiming to bridge the gap between the television professional and the non-professional with something vital to say and how, this volume supplies needed background to those given responsibility for an organization's efforts in this medium It suggests what television can help to accomplish, it gives a behind-the-screen acquaintance with a station and its facilities, it affords guidance in initial planning, approaching a station, detailed planning and scripting, performance and audience promotion

Because motion picture films are today a vital component of TV programming and provide most of the TV commercials we see, makers of films should find much of value to them in every one of the book's ten chapters.

The chapter, "Using Film and Videotape" dwells on the importance of using 16mm black-and-white film for economy production of program material; explains the place of both single- and double-system sound, and explores the potentials of the amateur film as program material •

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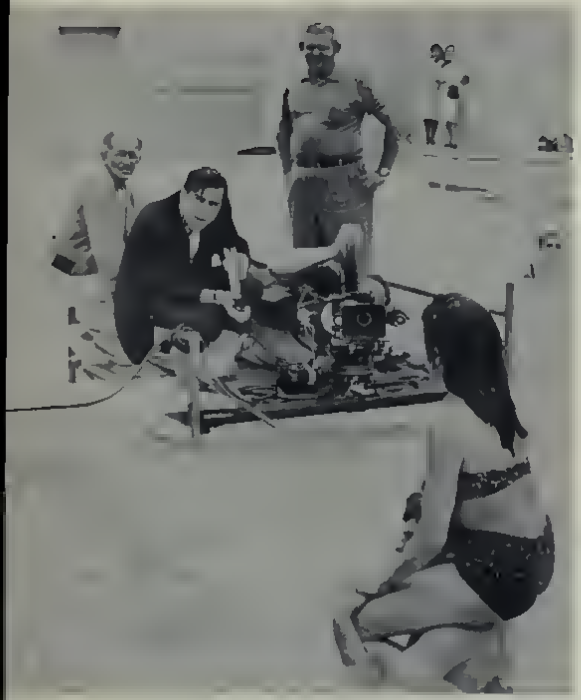

DIRECTOR OF PHOTOGRAPHY Lionel Lindon, ASC, (far left) perches on parallel rail while his operator lines up low-mounted Mitchell camera on players in foreground for a scene for "The Young Savages," directed by John Frankenheimer (2nd from left) and photographed on location in New York.

Hazardous Assignment In An Asphalt Jungle

Filmed in the story's actual juvenile gang-land locale, some of the most factual scenes in "The Young Savages" had to be photographed under cover with a hand-held camera and a newsreel light.

By HERB A. LIGHTMAN

LOCATION DISCOMFORTS and dangers are occupational hazards expected and taken in stride by cameramen working far from the comforts of the Hollywood sound stage. But seldom has a cameraman worked under such precarious conditions as did Director of Photography Lionel Lindon, A.S.C., while photographing the smashing drama of juvenile gang warfare, "The Young Savages".

Much of this film was shot in the actual locale of Evan Hunter's hard-hitting novel from which the picture was adapted—a teeming cauldron of mixed "minorities" crammed within the confines of New York's Spanish Harlem. This is an area seething with unrest, where deadly teenage gang wars are common, where any stranger caught on this switchblade-protected "turf" is subject to robbery, mayhem or even murder—simply because he is a stranger. It is a district where street gangs often battle to the death, armed with knives, "zip" guns and Molotov cocktails. It is a domain ruled by fuzzy-faced overlords, each of whom "runs" a block or two of territory, exacting tribute from frightened shop-keepers in return for "protection" —an area where even the police tread lightly, nervously patrolling their beats in pairs.

Cadillacs Abandoned

Into this jungle loaded with ominously restless "natives" moved Burt Lancaster (star of the film), director John Frankenheimer, and the technical crew headed by Lindon. When scouting locations, this Hollywood group wisely abandoned their Cadillacs far downtown, took a cab to within four blocks of "no man's land," and walked from there, dressed in old clothes to look as nondescript as possible. They had decided to go into the area minus the protection of a police escort, reasoning that such a bodyguard would have made them too conspicuous.

Ever aware that hostile eyes watched their every action, no overt move was made until the company had set up the camera in an alleyway to shoot the initial scene of the picture. Suddenly a fusillade of missiles rained down upon them—tin cans, milk cartons filled with rocks, garbage, etc. After this onslaught, the crew members considered wearing steel helmets of the type used by construction workers, but the idea was abandoned when it was realized that the tin hats would provide perfect targets for their unseen assailants on the rooftops.

Conferences with harassed police officers brought the suggestion that "If you can't fight them it's better to join them." Several of the young actors playing hoodlums in the picture had actually been raised in this squalid neighborhood and, with them acting as intermediaries, secret contacts were made and conferences arranged with two youthful gang leaders who controlled sections in which the com-

LIONEL LINDON, ASC, who directed the photography of "The Young Savages," is a veteran cinematographer with such distinguished pictures to his credit as "Going My Way," "A Medal For Benny," "The Blue Dahlia," "Destination Moon," and "Around The World in 80 Days," for which he received an Academy Award

pany wished to shoot. The leaders were placed on retainer for an undisclosed sum and the word went around via jungle telegraph to "lay off" the moviemakers while they were shooting in the prescribed areas. To further cement relations and add a touch of stark realism to the picture, the actual gangs themselves were hired to portray enemy tribes in the film.

"The Young Savages" tells the story of the murder of a blind Puerto Rican boy, a member of the Horsemen gang, by three young hoodlum members of the opposition Thunderbird gang. The Assistant District Attorney (portrayed by Burt Lancaster) is assigned to prosecute the case, a job made doubly difficult by the fact that one of the apprehended juveniles is the son of a woman with whom the attorney was once in love and almost married.

Surmounting almost inconceivable odds in what appears to be a straight cold-blooded murder situation, the attorney is able to determine that the so-called innocent victim was actually the leader of the Horsemen, and that the son of his former fiancee, although misguided and delinquent in a sense, had not inflicted the fatal stab wound.

Action Filmed Unobtrusively

The film opens on a high note of drama with a strikingly photographed sequence showing the three young assassins relentlessly marching into enemy territory, knocking bystanders out of their path and viciously stabbing the blind boy as he stands playing his harmonica on the front "stoop" of a tenement. They dash down the steps, knock over the dress racks of a sidewalk peddler and, pursued by police, take off over fences and down back alleys. After a wild chase through a rubble-strewn area where buildings are being razed by a demolition crew, the assassins are finally cornered in an ambush of converging cars and taken into custody.

Photographing this melee on the jam-packed streets of the tenement area was a challenge of the first order. There was no way of controlling the belligerently curious crowds. Battery-operated cameras were mounted on small luggage trucks pushed along the sidewalk by grips. One camera would start following the boys and the crowd would gang up on it. A second camera concealed around the corner would then pick up the action and follow the boys until the crowd discovered it and shifted their attention. Thus, with one camera serving as decoy, the other one filmed as much of the scene as possible. Meanwhile, the grips were hard pressed to find smooth stretches of sidewalk along which to roll the improvised luggage-truck dollies.

Camera Concealed in Bus

At one point the filming operation was camouflaged by mounting the camera inside a bus which followed the boys down the street. This worked fine except that whenever the bus stopped, commuters, believing that the bus was in service, would bang on the door for admittance. Other cameras were concealed in the doorway of a delicatessen, and also in one or two other shops to get unobtrusive shots of the teenagers in action.

At the scene of the crime, a camera was set up at a low angle on the sidewalk. Dress racks were placed near the steps of the building both for atmosphere and to partially conceal the camera

Continued on Page 435

"THE YOUNG SAVAGES," as the title implies, concerns the hunting down by police of three teen-age hoodlums accused of murdering a blind member of a rival gang. Much of the action was filmed in areas that are actually under domination by young heads.

SPIN IT ON A TURNTABLE

By ROY ZEPER

THERE ARE OFTEN opportunities in industrial and TV commercial film production to use a rotating turntable to heighten interest in an otherwise static scene, or to provide attention-arresting motion to a title.

A commercial product or industrial component, when rotated on a turntable before the camera, shows what it looks like when viewed from several angles without the need of presenting it in a series of separate cuts. In a similar manner, a series of related products can be shown—one following the other as they come into the field of view of the camera. The resulting improved visualization and subject movement provides a more interesting presentation.

As Titling Aid

In photographing titles, many unusual effects can be achieved using a turntable, including some effective transitions between titles. A spinning title can be superimposed over a static background, or both the title and the background can be rotated together. Another variation is to photograph the title card as it rotates, and then superimpose it over a live or photo background, either during the photography or by double-printing at the laboratory.

Where it is desired to produce a title that starts with a fast spin, then ends with the title in proper upright position, the title (or photograph) is aligned on the turntable in the vertical "end-of-the-spin" position, but upside down. Photography begins by exposing a specified number of frames of the title in the static position, then the turntable is started and the photography is continued for the desired amount of footage or frames. After this film is processed, it is turned end-for-end (the head is reversed with the tail) so that when projected, the title will be upright and read correctly from left to right. The title will flash on the screen while spinning, then come to a stop with the title text properly upright.

Variable-speed Motor Best

In constructing a turntable for this kind of work, a number of factors should be considered: it should be of the size and strength to support the subject to be filmed; the torque of the turntable motor should be ample to rotate it evenly regardless of the weight of the subject; and the speed (rpm) should suit the effect desired. The most desirable setup employs a motor that can be varied in speed, and a suitable rheostat for altering the voltage input to provide a range of speeds.

Continued on Page 428

SPINNING TITLES (top photo) can be made in two ways—by animation or by use of a turntable, as pictured. Whereas single-frame animation would require hours, spinning the title card on a turntable set up before the camera achieves the same effect in less time and with marked saving in production cost. In lower photo, a large turntable supported by legs and ball-bearing casters, provided an effective display of Philco's new line of portable TV sets for a TV spot photographed by author

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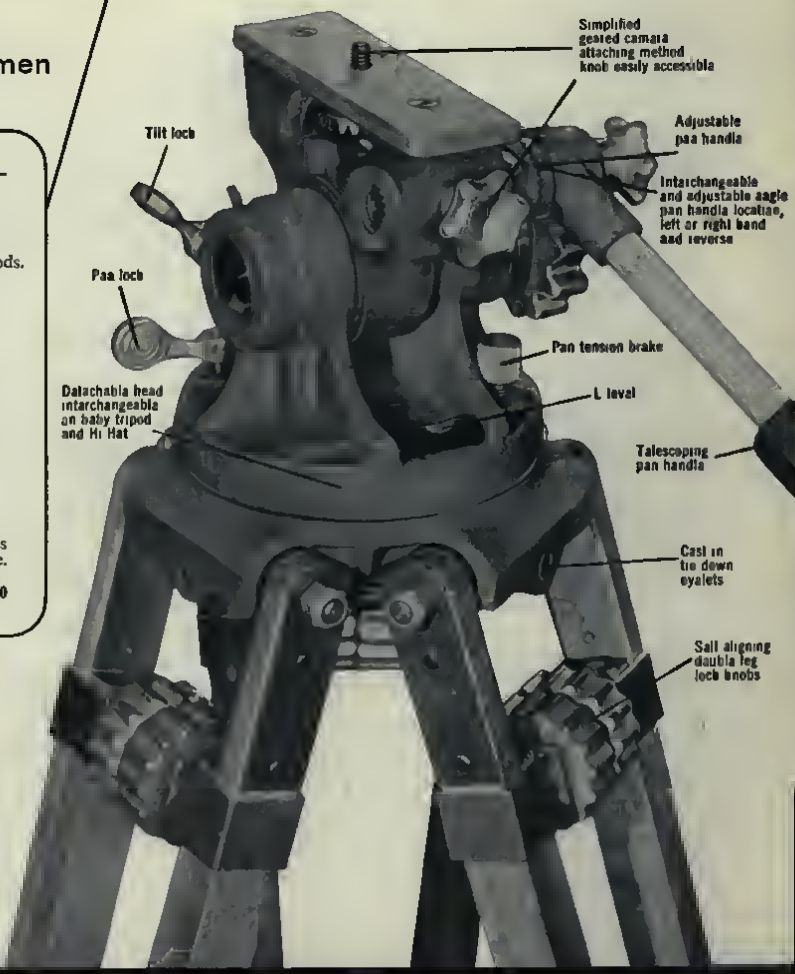

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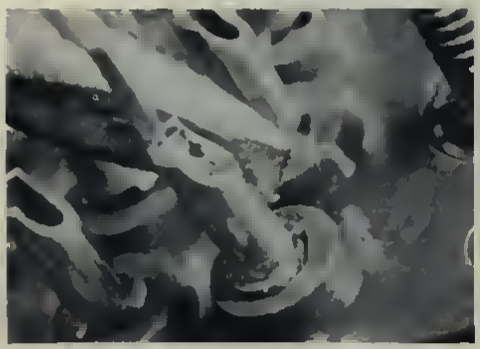

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A Film On Soldering Techniques

The prize-winning "On Solder" reveals advantages of using a reflex camera to shoot high-magnification closeups in straightforward photography

By JOSEPH V. MASCELLI
Editor, American Cinematographer Manual

"ON SOLDER" — an industrial film produced for the purpose of training and encouraging soldering technicians toward greater reliability in their work—has been acclaimed for both its inspirational handling of a prosaic subject and its extreme close-up color cinematography. The film was awarded the Blue Ribbon for best training film in the recent American Film Festival in New York, and also won the coveted "Cindy" award in the Instructional Training Film category of the Industry Film Producers Association's annual awards presentation June 3rd.

The picture, sponsored by Claude Michael, Inc., of Glendale, California, industrial distributors of soldering materials, was produced as a public service. It carries no advertising or promotional message of any kind. It was produced and directed by Ron Hagerthy, president of Scope Film Associates of Hollywood, and written by Hagerthy and Robert E. Michael. The latter also served as technical ad-

PHOTOS AT LEFT are frame enlargements from the prize-winning 16mm color film, "On Solder," photographed by author. Top photo (1) shows solderers at work on memory unit that required over 16,000 soldered connections. Photo (2) is high magnification shot of start of a soldering operation. Area shown is just one-half inch in width. (3) Solder flux has been applied, heated with iron, and wire is about to be inserted in cup of terminal. (4) Closeup of soldered joint. All scenes were photographed with an Arriflex 16 camera and Pan Cinor zoom lens augmented by supplementary closeup lenses. Standard Schneider lenses were also used with Arri extension tube.

visor on the soldering sequences. The author photographed the picture in Eastman Ektachrome Commercial, using an Arriflex 16 camera equipped with Schneider Lenses and a 17mm-to-70mm Pan Cinor zoom lens.

The need for a film depicting proper soldering techniques had been apparent for some time, and although several solder pictures were available, they were either obsolete or fell far short of their goal. The Department of Defense, and the many aircraft, missile and allied electronic industries employing solder have been severely handicapped by unreliable soldering techniques. Multi-million dollar missiles have failed because of a poor solder connection. While such cases are rare, they are a matter of record. Many intricate electronic components are rejected, or fail to operate properly, because of faulty soldering.

Film A Vital Need

The Michael organization recognized the importance of this vital industry-wide problem and set about to correct it. The need existed for a film that would depict correct soldering techniques and inspire soldering technicians to take a greater interest in their work by being made aware of its importance and thus be stimulated to greater effort. A "by-the-numbers, one-two-three, this-is-how-you-do-it" training film was not the answer. The subject required dramatic handling in an inspiring manner that would awaken new interest in efficient soldering methods. The picture had to demonstrate the proper soldering techniques in a way never before depicted—by moving in with the camera as close as possible to show what actually happens to a drop of solder when it is used as a bonding agent. For, as experience has shown, the success or failure of a missile, a radar system, a television network or a complex electronic circuit often depends on *a single drop of solder!*

My introduction to the film project was via a 'phone call from Ron Hagerthy asking: "How close can you zoom?" I answered: "Oh, to about the size of a match book cover." A pause. Then: "We gotta go closer than that!" After a few minutes of such questions and answers I dismissed the problem and told Ron not to worry, but to go ahead and write the script and plan the camera set-ups as close as he liked. Later, when actual filming began, I was to rue my oversimplification of the problem because there were several factors that I had overlooked, such as the fact that the scenes were live action rather than static setups, and several physical problems were encountered that were not anticipated.

"On Solder" opens with a literal bang!: a missile launching which turns out to be a failure and shows the giant rocket returning to earth. It then dwells briefly on the history of soldering from earliest Biblical times. Soldering tools and materials are then shown with the aid of drawings and cutaway models. Here excellent use was made of "A-and-B" printing by dissolving from a full shot of a stock soldering iron to a precisely duplicated cutaway model in exactly the same position. The zoom lens provided additional movement to the match dissolve. The stock iron was first shown and then dissolved to the cutaway model. The lens then zooms in to show in closer detail the heating element and other parts, and the camera is panned in a tight close-up for the length of the tool.

Ultra-closeups Utilized

The major portion of the picture is devoted to actual soldering techniques employed in bonding various types of components, printed circuits, etc. It is here that extreme closeups are utilized so that the tip of the smallest soldering iron and a single drop of solder are shown full screen. The importance of correct heat, proper application of the soldering iron to the object being bonded (not to the solder itself) is clearly shown in a series of extreme closeups. How the rosin flows from the cored solder, and

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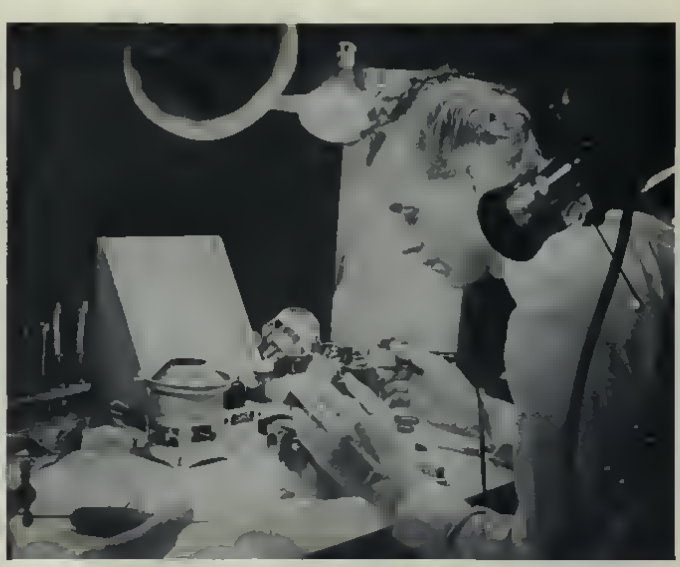

THE ZOOM LENS PEERS over shoulder of technician to record detail of recommended procedure for industrial soldering as revealed in motion picture, "On Solder." When closer shots were made, with both camera and lights moved nearer to subject, technician's hands were wrapped in wet towels for protection.

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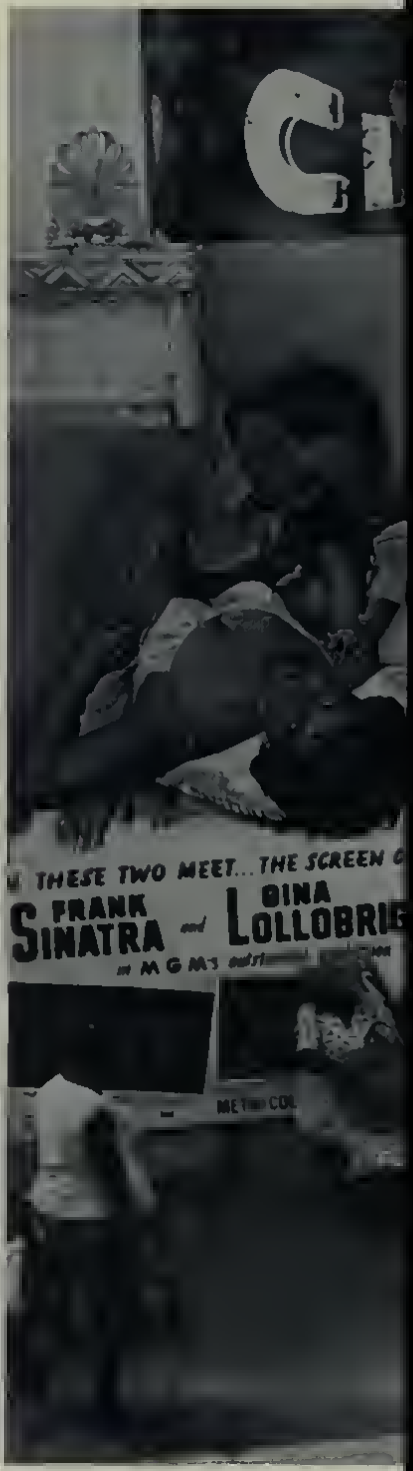


GLOBE
AND
EMASCOPE

Shooting A Documentar

BY LEO OZOLS

AUYANTEPUY — THE "DEVIL'S MOUNTAIN" — was like Mt. Everest. Untouched and virgin, it had thus far defeated all who had attempted to scale it in an effort to find the lost plane of Jimmy Angel who earlier had crashed on this lofty mountain top of Venezuela.

Angel had mislanded on the mountain in 1937 and subsequently discovered there the highest uninterrupted waterfall on earth—a 3700-foot vertical waterdrop, since named for him. As far as is known, no human being had ever before set foot on the lofty peak of Auyantepuy; no one had seen Angel's plane nor the headwaters of the falls. Many had been tempted, some had even tried, because of the fascinating legends about the powerful Indian god Canaima (who, it is said, dwells atop the mountain

▲ AUTHOR OZOLS started shooting with a Mitchell 35, but abandoned it after encountering trouble with Indians hired to carry equipment and supplies

◀ OZOLS ASSISTANT was Spanish cameraman Paco Ortega, shown here preparing to shoot with a tripod mounted Eyema, while native Indians look on

▼ OZOLS AND CREW (bottom left) prepare to shoot re-enactment of Expedition's start. Adjoining photo shows Ozols and two Indian bearers fording a treacherous stream enroute to Auyantepuy

n The Wilds Of Venezuela

Hired to photograph an expedition searching for the headwaters of famed Angel Falls, author Leo Ozols inherited the project and the film he shot became the prize-winning documentary, "Where Angel Falls Are Born."

and washes his feet in the waters of Jimmy's falls) and of the fabulous gold and diamonds there—and also the ghosts, and the danger, and death ever-present.

Making a motion picture about the devil's mountain had been a burning ambition of mine for many years. Until recently, I was unable to put my plans into practical operation because of the cost of such an undertaking. I had endeavored to locate a sponsor or to interest film producers who could market such a film, but they were skeptical of a film crew's chances of ever reaching the mountain top, much less producing marketable footage. After all, it was argued, the mountain already had defeated several serious and well-equipped expeditions. How could an untried motion picture unit succeed where veteran professional expeditioners had failed?

Opportunity Knocks

After months of fruitless effort to interest a sponsor, there came an inquiry from Caracas Films, Inc. The Central University in Caracas was preparing to send a well-equipped expedition to ascend and conquer Auyantepuy, and the University desired a thorough motion picture coverage of the undertaking. I accepted the assignment and was given three days to get film and equipment together and be on my way. I was instructed to precede the expedition and to stay ahead of it in order to photograph all phases of its progress. The understanding was that if the expedition at any time found it impossible to continue with its mission, I would then be at liberty to continue the ascent in any manner I saw fit and to proceed with my crazy plan to locate Jimmy Angel's plane and reach the falls' headwaters.

The three-day preparatory period allowed us hardly enough time to gather together the necessary motion picture cameras, equipment and film. My assistant was Paco Ortega, a Spanish cameraman who had previously accompanied me on several jungle filming expeditions. While I was trying to borrow or rent cameras, Ortega was rounding up film. I succeeded in locating a Mitchell, an Arriflex, a Cineflex and two Bell & Howell Eyemo cameras, plus two Bolex H-16's. Ortega had not fared so well; he learned there was no 35mm Eastman Color film in Caracas and that it would take several weeks for a shipment to arrive from the U.S. He had, however, obtained all the 16mm Kodachrome that we would need. Our big problem was "Where to get a supply of 35mm color film, and get it fast."

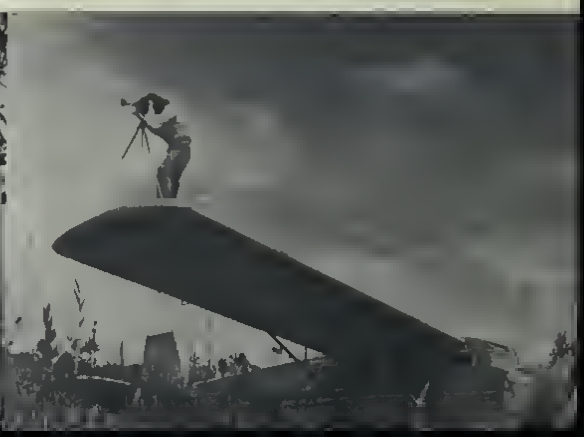
We began by telephoning all motion picture producers in this area and asking for the loan of film until our supply arrived from the U.S. With difficulty, we rounded up 3,000 feet of 35mm color film, then cabled an order for the rest of our requirements with instructions to rush it to us by air.

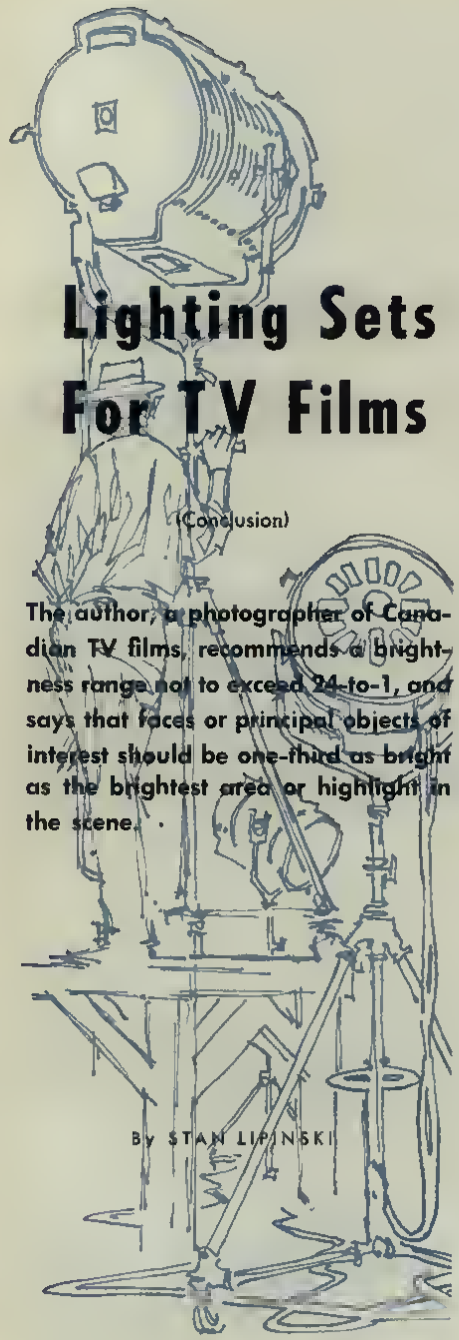
Getting cameras and film together had consumed all our precious time and we now were faced with departing for Ciudad Bolivar without food supplies or camping equipment. Optimistically we looked forward to purchasing these when we reached

Continued on Page 432

HAVING LOST the Cameraflex and with the Arriflex out of commission because of a dead battery, Angel Falls, climax of Ozol's quest, had to be photographed with Eyemo camera

LEO OZOLS photographs a vista from wing of Jimmy Angel's lost plane, which Ozols located bogged down in mud where it had lain for more than 20 years





Lighting Sets For TV Films

(Conclusion)

The author, a photographer of Canadian TV films, recommends a brightness range not to exceed 24-to-1, and says that faces or principal objects of interest should be one-third as bright as the brightest area or highlight in the scene.

By STAN LIPINSKI

LAST MONTH'S ARTICLE dealt primarily with placing the lamps on the set. In this, the concluding article of the series, I shall deal with measuring and evaluating the set lamp illumination, determining exposure, and shall recommend some techniques for both indoor and outdoor cinematography for TV films.

Before discussing the measuring of the set lights, I would like to go back to basics and remind the reader again that in photography we have to deal with three factors: Exposure Index, Range of Brightness, and Lighting Contrast, and we have to comply with them irrespective of whether we are shooting in the studio, exterior, or indoor location. The exposure index means in effect the stopping down of the lens and the selection of the shutter speed to give a correct exposure under certain lighting conditions, and it can also mean the number of foot-candles of illumination which must be directed at the photographed object in order to obtain a correct pre-set exposure. In most cases the final lighting is a combination of various lights directed at the photographed object. Some of these lights affect the exposure, some don't. Generally speaking, the main source of light, the so-called key light, plus all the other lights situated behind or beside the camera, make the exposure. The others, such as back-lights and rim-lights, have little or no effect on the exposure.

It has been the commonly accepted technique in movie making to measure the illumination of the scene in foot-candles with the help of an incident light meter. And there is, of course, very good reason to use that kind of meter. By knowing the number of foot-candles of light falling on a certain object we can separately adjust each source of light to our requirements, balance the ratio between key and fill lights, and keep the same balance for the whole sequence or even the whole production. This method of measuring light also offers other advantages; one is that it provides a dependable check on individual lamps. If a lamp is slightly off its center in the optical axis, or if the bulb is old, or gives yellow light instead of white, we can detect those faults and correct them. I think no other system of setting lights in a professional and practical way can replace the setting by incident light measurement.

(d) Measuring Exposure.

The second stage of this lighting procedure consists of measuring the exposure based on the brightness of the scene; any of the means of measuring brightness can be applied at this stage. Before the exposure can be determined exactly, we must know, of course, the speed of the emulsion being used, on which the lab will base its processing. It is worth emphasizing again how important it is in TV production to have the cooperation of the laboratory technicians in maintaining constant gamma in negative and positive

Continued on Page 437

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PHOTO RECORD of X-15 in flight, made with 16mm camera mounted inside the craft and pointed aft

CAMERA MOUNTED inside B-52 mothership records action of the X-15 as it drops from wing of B-52

THE X-15 dropping from B-52 as recorded by camera in F 100-F photo chase plane

FILMING THE FASTEST FLYER

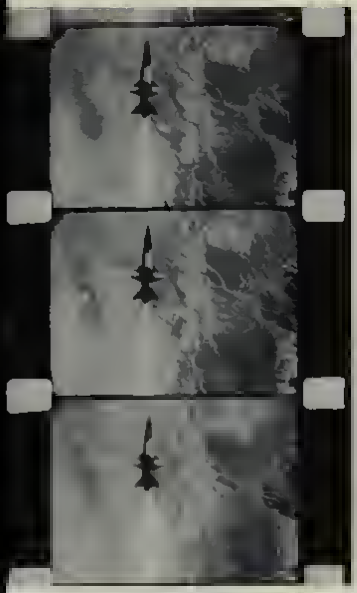
Employing a number of 16mm cameras strategically placed, North American Aircraft's film unit produced a remarkable documentary about a remarkable aircraft—the X-15, which has flown faster and higher than any craft to date.

By DARRIN SCOT

EXEMPLIFYING THE TECHNICAL excellence and cinematographic know-how which characterizes films produced by the in-plant motion picture unit of North American Aviation's Los Angeles Division is "X-15" — a spectacular 26½-minute 16mm sound-and-color documentary of the now famous craft which has been aptly described as "half airplane, half spaceship."

"X-15" details in a factually dramatic way the development of the revolutionary experimental aircraft bearing the same name, and delineates the various phases of the exhaustive tests given it by the company's Ace test-pilot, Scott Crossfield. The countless delays, disappointments and near-disasters encountered during the testing period and the craft's ultimate triumph in flying higher and faster than any experimental plane had ever flown before furnish the film's dramatic highlights.

The drama arises out of precise



GSAP camera record (looking earthward) showing the X-15 dropping away and igniting its rockets.

CAMERA IN photo chase plane follows the X-15 as it lands on dry lake bed at Edwards Air Base

cinematic emphasis on elements which, per se, are highly dramatic but which might have been made to seem almost routine with less skillful handling.

Preliminary check-out testing, showing the pilot being whirled about in a centrifuge capsule mounted on the end of a long rotating boom, was filmed at the Naval Air Development Center at Johnsville, Pa. Scenes showing the outside of the capsule were filmed in 35mm Eastman Color and later reduced to 16mm. A remotely controlled camera inside the capsule itself filmed closeups of the pilot as he was thrust back into the cockpit by the centrifugal force.

Manufacturing sequences were photographed at North American's Los Angeles plant, but the bulk of the film (having to do with the flight-testing phases) was photographed at Edwards Air Base, where a crew of Frank Sinatra's Essex Productions recently completed shooting backgrounds for a feature production based on exploits of the X-15.

To obtain the aerial shots seen in "X-15", three cameras were mounted at strategic points within the "mother ship" — the B-52 bomber which carried the X-15 aloft, tucked under its wing, and released it when the proper altitude and speed was reached, thus to fly on its own power. Two of the cameras were Arriflex 16's; one was mounted in a camera pod aft and the other, just opposite the nose of the craft. A third camera, of the remote-controlled GSAP type, was mounted directly above the pylon of the X-15 and pointed straight down to capture extremely effective dropaway shots of the X-15 as it was launched. (See photos.)

A problem of operating current for the Arriflex cameras arose when it was discovered that the 24-28-volt system on the plane was not compatible with the standard 8-volt motors on the cameras. The problem was solved by rewinding both the armatures and fields of the Arriflex motors to operate on 24-volts. To protect the cameras from possible malfunctions due to the extreme cold at high altitudes, ordinary General Electric heating pads plugged into

Continued on Page 429

CAMERAMEN of North American Aviation's motion picture unit preparing to "track" a test event. A similar set-up was used to shoot landings of the craft during the initial flights of the X-15.

When You Shoot In The Tropics . . .

. . . . you'll encounter a number of problems which careful advance preparation will enable you to overcome. A number of them are discussed here with advice on how to cope with them.

THE TWO BASIC SOURCES of trouble when photographing in tropical regions are heat and humidity. Heat alone is not the worst factor, although it may necessitate special film processing techniques, and may shorten the life of sensitive materials. High humidity, however, can cause serious trouble even at temperatures but little above normal, and the effects of high humidity are increased by high temperature.

Thus, in wet tropical regions, the principal causes of damage to photographic supplies and equipment are continuous high temperature and, particularly, of high humidity which prevail there. Associated with these conditions are biological factors. The natural warmth and moisture are conducive to the profuse growth of fungus and bacteria, and encourage the activities of insects. Many photographic products are food on which these organisms flourish—gelatin in films and filters, and papers, leather, adhesives, and so on. Even if they cannot attack these materials directly, they can develop an environment which can. Also fungus can either directly or indirectly induce corrosion in metals, attack textiles and leather, change the color of dyes, damage lens glass, and cause a great variety of other forms of deteoration.

Sources of Trouble

The probability of damage to films, cameras, lenses, etc., increases with frequent handling and transportation, especially under the difficulties met in hunting and scientific expeditions and in military operations. Exposure to harm is greater when equipment is used out of doors, on the ground, or with makeshift facilities. In any locality the temperature is much lower at high altitudes, so that dew is likely to form on some equipment following arrival by air transport.

Relative Humidity: The condition of the atmosphere with respect to moisture content is usually described in terms of "relative humidity." This is the ratio, expressed as a percentage, between the quantity of water vapor actually present in the air and the maximum quantity which the air could hold at that temperature. Thus, if a given sample of air contains only half as much water as it would at saturation, the relative humidity is 50 percent.

When the temperature rises, a given space is capable of accomodating more water vapor, so that if air is heated, the relative humidity decreases, and vice versa. When air is cooled sufficiently, a saturation point (100 percent relative humidity) is reached, and below this temperature drops of water or "dew" are deposited. In tropical climates, this "dew point" is often only a few degrees below the actual temperature during the day and is reached when the temperature drops at night. This information, therefore, is important to those who would understand how and to what extent moisture induced by extremes of humidity can deteriorate motion picture film.

Combatting Moisture

The amount of moisture absorbed by films and by non-metallic parts of equipment is determined by the relative humidity of the atmosphere. Therefore, the moisture absorbtion can be reduced by lowering the relative humidity, either by removing some of the

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WHEN IN THE TROPICS

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moisture with a desiccating agent or by raising the temperature.

Preparation and Protection of Equipment

To save time and avoid damage, cameras and other equipment should be made ready in advance It is well worth while to have the equipment thoroughly overhauled and cleaned, preferably by the original manufacturer who should be advised as to the type of climate in which it will be used Cases, packing material, and moisture-absorbing material should be obtained for all equipment and supplies.

Ample protection during transportation and storage is readily obtained by the use of hermetically sealed cans or metal-foil bags, or other water vapor-proof containers, and a suitable desiccating agent If the containers have been properly sealed and contain an adequate quantity of the desiccant, they will protect the contents practically indefinitely. There is, however, one reservation and caution. If precision instruments which require lubrication with certain types of light oils are subjected to high temperatures while in such packing, the oils may evaporate, leaving a gummy residue on the bearings. This may prevent proper functioning until the equipment can be cleaned and relubricated

The protection of equipment which is in active use requires a somewhat different approach The relative humidity can be lowered in an equipment storage cabinet by burning electric light bulbs or an electric resistance heating unit continuously in the lower part of the cabinet. The number of lamps should be adjusted to keep the temperature about 10° F above the average prevailing temperature Air spaces and small holes should be provided at top and bottom of the cabinet and through the shelves to allow a slow change of air to carry off moisture introduced by the cameras and equipment. The positions of the holes should be staggered on the different shelves in order to produce a more thorough change of air Since high relative humidity favors the growth of fungus on lenses, filters, and other surfaces, storage in such a cabinet will help reduce the growth and may prevent it entirely.

Electric dehumidifiers are now available in many of the larger cities in tropical regions They range in price from $75 to $250 with $150 being a fair average With these, a whole room and its contents can be dried, provided the room can be closed to outside air In dehumidified rooms, the humidity will not increase rapidly during short power failures, as it would in heated closets In a small, tightly sealed room an average unit in operation for 12 hours out of 24 can keep the relative humidity below 60%. This should be checked about once a month with an RH meter or sling psychrometer

When it is not practical to use a hot cabinet or electric dehumidifier, equipment should be stored in an air-tight case containing an ample supply of desiccant. Two cans of silica gel (the size of shoe paste cans) will do a very good job of drying equipment in a sealed ten gallon paint can (one with a gasket and a "pound shut" lid) A half-pound bag of silica gel works well in a gasketed 55 gallon "open top" drum However, where shipment and handling are involved or where the containers are to be opened briefly a few times, double or even three times the quantity of gel will provide a reserve of protection. Properly dehydrated containers will momentarily feel cool to an inserted hand due to rapid evaporation of the normal skin moisture Its absence means the silica gel needs replacement or regeneration.

If none of these methods is practical, and the equipment must of necessity be left in an atmosphere of high relative humidity, the equipment should be opened and exposed to the sun at frequent intervals in order to dispel moisture. Such exposures should be kept short to avoid over-heating. Cameras loaded with film should not be exposed to the sun more than necessary.

This article, excerpted from the American Cinematographer Manual, is one of several featured in this new, helpful hand book for motion picture photographers, which now is on sale at principal book stores and camera shops, and also available direct from the American Society of Cinematographers, Box 2230, Hollywood 28, Calif. Price is $7 50 per copy, post paid (Add sales taxes if ordered within state of California)

Cameras should always be protected from *excessive* heat because the lenses are composed of several elements of glass cemented together, and since some cements melt at 140° F and begin to soften at 120° F, it is obvious that the lens elements might become separated or air bubbles form if the lens becomes heated to such temperatures Cameras should not be handled roughly or subjected to sudden jarring when used at high temperatures because any slight jar might change the position of the lens parts

Care of Equipment

One of the best protective measures that can be supplied in the tropics is to clean thoroughly every piece of photographic equipment at frequent intervals and to air and sun it whenever practical This is particularly important for retarding the corrosion of metal surfaces and the growth of fungus, or mold, on lens surfaces and on leather coverings Fungus on a lens will clearly impair its definition and light transmission

Lens cleaning fluids and papers now on the market are recommended for cleaning lenses During the tropical dry season or in any desert areas, any dust should be removed from the lens surfaces with a sable or camel's hair brush before the lens tissue is used, in order to avoid scratches Lens cleaning tissues that contain silicones should not be used on coated lenses because they leave an oily film on the lens surface which changes the color characteristics of the coating, reduces its antireflection properties, and is almost impossible to remove Leather coverings and cases can best be kept clean by wiping them often and thoroughly with a clean, dry cloth. Frequent cleaning and polishing will minimize corrosion on exposed metal parts

When pictures are to be made in desert areas, the general recommendations for tropical countries will apply. However, there is one additional difficulty which causes considerable trouble, and that is wind-blown sand and fine dust. Wind-blown sand can etch the surface of the lens so that it becomes unusable This can be prevented by protecting the lens with a Skylight Filter or a piece of clear optical glass Both the filter and the glass are inexpensive and can be replaced easily if they become damaged

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Precision in manufacture and precision in operation, is the HFC Professional Hand Rewind. Three separate models are available, RE (for normal winding), REF (with a top friction control to retard the pull on the film) and REL (with the elbow brake used for film inspection). The gears are precision cut w/4-1 ratio, also w/2½:1 ratio on special order.

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*How to select a recorder to start your MAGNASYNC-MAGNAPHONIC SOUND SYSTEM

Sound Equipment Checklist

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Nomad MARK 1	A versatile 7 lb professional quality recorder/reproducer all transistorized and positively sprocket hole interlocked with your 16mm camera or projector , CANNOT GET OUT OF SYNC! Can be hand held or tripod mounted Wide selection of accessories available Basic System $675	X													X	X	
Nomad MARK 11	The 12 lb featherweight Mark 11 a professional double system recorder/reproducer is completely transistorized self-contained, and highly reliable with maximum recording qualities and operating economy Power consumption is only 20 watts From $985	X													X	X	
X-400	When lightweight portability is a must the 27 lb X-400 Type 1 is the answer! Another reason so many producers choose this machine is that it is genuinely professional, and yet, surprisingly economical! From $985		X			X	OPTIONAL	OPTIONAL	OPTIONAL						X	X	OPTIONAL
TYPE 1	The Type 1 is a miniaturized version of the Type 5 Low power consumption and extreme portability has made this 39 lb unit a popular selection for remote location production by leading professional motion picture studios From $1430		X	X		X	X	X	OPTIONAL		X				X	X	OPTIONAL
TYPE 1S	The X-400 Type 1S is designed for the man who wants everything in one case playback amplifier, monitor speaker, footage counter and torque motors You can be proud to have this machine represent you on any sound stage! From $1385		X			X	X	X	X	X					X	X	OPTIONAL
TYPE 5	The most popular magnetic film recorder in the world is the Type 5! With this unit and all its operational conveniences, you are definitely in the "major league" The Type 5 owner always starts his pictures with a special feeling of confidence in the realization that he has allowed no compromise in the selection of equipment From $1650		X	X	X	X	X	X	X	X	X				X	X	OPTIONAL
MARK 1X	There is nothing on the market that compares with the remarkable Mark 1X This unit is in a class by itself with push-button remote controlled relay functions, plug in audio elements and all the "extras" that make for flawless recording under the most adverse conditions From $2145		X	X	X	X	X	X	OPTIONAL	X	X	X	X	OPTIONAL	X	X	X

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WHEN IN THE TROPICS

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Neither introduces the need for any increase in exposure, and they can be left on the camera for the entire time it is being used. The use of such a filter is also valuable when shooting at sea or along the seacoast, where salt spray may be blown on the lens.

Exposure: Black-&-White Film

The exposure of black-and-white film in tropical photography is strongly influenced by the illumination in the shadow areas. The moisture and dust contents of the atmosphere are important because shadows are illuminated only by light scattered by particles suspended in the air, except where supplementary lighting or reflectors are used. Thus where the atmosphere is very dry and clear, objects which do not receive the direct light of the sun appear, both to the eye and to the camera lens, to be in deeper than normal shadow. In regions like the southwestern United States or central Mexico, for example, the brightness range of average outdoor subjects is much greater than it is in less clear atmospheres.

In photographing people, this effect and the high altitude of the sun combine to put the eyes in deep shadow, or even to give the effect of backlighting. Therefore, it is best to avoid taking pictures, particularly closeups of people, when the sun is overhead, or else to use reflectors or booster lights to lighten the shadows.

Exposure meters should always be used with a reasonable amount of judgment and experience, and this is especially true in locations with such unusual atmospheric and lighting conditions.

In the jungle areas of South and Central America, agricultural methods result in a considerable amount of burning of trees and brush in the dry season. The smoke, composed of solid particles, hangs in the lower atmosphere and is not easily penetrated by filters. Also, at the height of the wet season in many localities, the water haze becomes almost as impenetrable as a heavy cloud. Distant photography is best done a few weeks after the close of the wet season and before burning begins or a few weeks after the first rains of the wet season have settled the smoke particles and before the onset of the wet season haze.

When extensive photographic work in the tropics is planned, the development of a few test exposures in advance of regular production shooting may prevent major failures. It is usually sufficient to determine a basic exposure which can be modified to suit other films or conditions. Allowance should be made for different types of subjects. Beach scenes, for example, generally require about one stop less exposure than an average subject.

Exposure: Color Film

In general, the exposures for color films should follow the same basic recommendations as are given for temperate zones, with due regard to lighting and scene classification. There are, however, some differences in the lighting conditions and scene characteristics in the tropics which justify special consideration. The more important of these are as follows:

1. During the rainy season a light haze is generally present in the atmosphere. When this haze is present the disk of the sun is clearly discernible and fairly distinct shadows are cast. Under these conditions exposure should be increased over that required for bright sunlight by about one-half stop.

2. Frequently the brightness of beach and marine scenes is appreciably greater than that encountered in temperate zones. With such scenes the lens aperture should be decreased one full stop from that required for average subjects.

It should be remembered that the term "average subject" as used in exposure tables applies to a subject or scene in which light medium, and dark areas are roughly equal in proportion. It should not be taken to mean "usual" for a particular location or area. For instance, the usual desert scene is a "light subject," rather than "average subject," and should be exposed as such.

3. When the sun is high overhead, heavy shadows are cast across vertical surfaces, very much like those occurring in side-lighted subjects. Therefore, the exposure should be increased one-half stop more than normal, just as is recommended for side-lighted scenes. For closeups having important shadow areas, a full stop increase in exposure is recommended.

4. Many objects in the tropics, such as painted buildings and light-colored fabrics, and the leaves of many plants and trees, have a high reflectance for direct lighting. Consequently, with front lighting they should be treated as light subjects. With side, top, or back lighting they should be considered average subjects.

5. Very often the colors of objects will be affected by the green light reflected from nearby bright green foliage. Similarly, in courtyards or narrow streets, the side that is in the shade gets much of its illumination from the opposite sunlit wall, which may be strongly colored. There is little that can be done to correct for this situation, but it should be recognized as a possible cause of poor results in color pictures.

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SPIN IT ON TURNTABLE

Continued from Page 410

For small turntables, such as those used for titles and products or components of small size, the motor shaft is usually connected directly to the rotating table. Larger turntables, such as the one pictured here displaying several Philco portable TV receivers, require a heavier motor which usually drives the table through a gear-box or belt.

In cases where the turntable available is not variable in speed, its speed can be made to appear increased or decreased on the screen by altering the speed of the camera that photographs the action, (compensating exposures accordingly, of course!).

The speed of a turntable, if its motor is series wound, can be changed—speeded up or slowed down—by means of a rheostat or use of fixed resistors in the power line. Motors which are compound-wound or shunt-wound, and those known as "induction motors" cannot be materially slowed in speed by reducing the power input without danger of having them stop altogether during the middle of a take.

I have found that the most satisfactory turntable speeds for either product or title photography range between ½ rpm and 10 rpm. The slower speeds are usually preferable for an industrial or business film subject, where it is important to permit the viewer a com-

plete visual appraisal of the subject. Faster turntable speeds are better suited to TV commercials and short, quick scenes in industrial and advertising films.

While phonograph record turntables have often been employed for rotating titles or products before the camera, their fixed speed or limited range of speeds usually are too fast for satisfactory results.

Obviously it is important also to know how to calculate the amount of footage or frames that can (or should) be exposed for a given number of revolutions of the turntable, so that the photography can be correctly related to the prescribed screen time for the scene or TV commercial. To determine the number of revolutions of a turntable for a given period of time, figure as follows: a motor rated at 1 rpm will make one complete revolution in one minute, or an arc of 6° every second. Therefore, if we wish to make a ten-second camera run using a turntable operating directly off the shaft of a 6 rpm motor, we find that the turntable will travel the distance 6 × 6° or 36° per second, or 360° or one complete revolution in 10 seconds. Relative speed, of course, can always be determined by viewing the operation through the camera finder.

The motor, rheostat, and/or resistors required for an effective turntable construction are generally available from major electrical supply houses in every large city. ■

FILMING FASTEST FLYER

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the B-52's 110-volt circuit were wrapped around the equipment.

Two Vought VDR-4 cameras equipped with extreme wide-angle lenses were mounted inside the X-15 and pointed aft to show the rear section of the plane and the plume-like vapor trails streaming out behind as it soared into space. Shots of test-pilot Scott Crossfield in the cockpit, supposedly during the flight, were actually filmed after the plane had landed, with lighting so skillfully matched that the footage cut in perfectly.

On the ground, cameramen using 400mm extreme telephoto lenses mounted on Arriflex cameras tracked the streaking X-15 in its flight. Trying to keep it centered in the camera finders was a delicate operation, since

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any slight error in camera movement would lose the plane completely. A Mitchell tripod equipped with a Model-100 O'Connor fluid head helped preserve the smoothness of the follow shots.

The actual recorded talk-back between the test pilot and technicians in the B-52 and also those on the ground was used as sound background for many scenes, giving the test sequences a touch of authenticity. A whimsical human interest note was added when Crossfield, going up for another try after the plane had split apart in landing after one of its earlier tests, was heard on the intercom lustily singing "Back in the Saddle Again."

Effective Shot

An extremely effective shot inside the B-52 launching ship shows technicians viewing the X-15's flight on a television scope. The scene, which would have been impossible to photograph under actual flight conditions, called for some trick optical work. The original scene was shot with the television screen covered with black, non-reflective material. Then an aerial shot of the X-15 in flight at the proper angle and correct size was filmed. A black-and-white print of the scene was turned over to Hal Scheib of Cinema Research Corp., where (by means of a matte process) the shot of the X-15 was printed in to appear on the television scope.

Ektachrome, Standard Kodachrome and Commercial Anscochrome films were used in the various cameras shooting the X-15 documentary. Choice of film depended upon a number of factors. For example, because the Air Force has its own facilities for processing Anscochrome and because the AF wished a separate film record of certain phases of the flight which officers could process and examine as quickly as possible, some of the cameras were loaded with Commercial Anscochrome. Standard Kodachrome film was used in the GSAP camera mounted in the belly of the mother-ship and which shot straight down to record the drop-away of the X-15.

Exposure settings for the various cameras was pre-determined on the basis of normal daylight readings made on the ground on the day of the flight. Where time permitted, short pre-flight test shots were made and processed to verify calculations.

The cameras that were loaded with Ektachrome or Commercial Anscochrome employed No. 85 filters. In place of the conventional mounted filters, a small disc of No. 85 gelatin filter material was cemented to the rear element of each lens. This obviated the need for filter mounts and was an innovation that proved highly efficient with the Arriflex cameras.

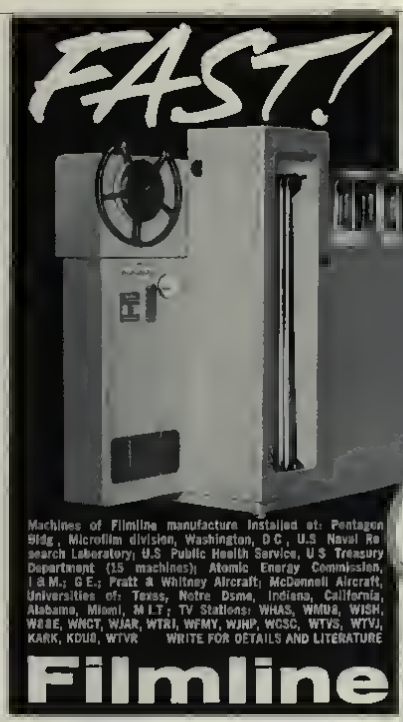
The impact of the X-15 film is the result, not only of technical excellence, but a peculiar "X" quantity that is best explained by Supervisor of Motion Picture Services Donald E. Dunn. "After the production crew began working on the X-15 picture, they became so personally identified with the program that they were pulling for it to be a success—and the film reflects their intense interest," Dunn points out. "This is typical of our operation. Our staff thinks 'picture' all the time—even when away from the job. Each of our cameramen is also a film editor—although some do more camera work than editing, and vice versa. We've found that when the same people who have shot the film also edit their footage they are happier and more conscientious because they are able to follow the project through all the way. That way they have a close identification with the end product."

The unit currently has a staff of nine cameraman-editors working in production, although there have been as many as sixteen working during peak production periods since World War II. This does not include eleven highly specialized film technicians who work exclusively on high-speed instrumentation filming.

Writer-Director Combo

Five full-time writer-directors work directly under Robert J. Gunther, Manager of Motion Picture Production. The company's writer-director combination has evolved from the special needs of its in-plant film production. The job requires good research ability—a man able to sit down with engineers and understand what they are talking about. Then, to make sure that the original concept does not get lost in filming, he must go out with the camera crew and indicate the important elements which must be stressed, functioning actually as a director. He must know motion picture technique thoroughly in order to make sure the film editor is provided with everything he will need to work with.

"If a man is a good film writer and a good reporter," Gunther explains,



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"he can handle some very complex technical subjects. Assuming he knows how to ask the right questions, he can write a good film on just about any subject without actually being an expert on it. We have, in the past, engaged so-called 'Hollywood' writers, but they have an unfortunate tendency to over-dramatise material which is basically factual. The subjects we are filming here are innately interesting and do not require any clever plot devices or gimmicks to make them more so. We try for an honest depiction of what goes on in the plant so that there will be a living record of what actually took place on specific projects."

The product of the unit covers a wide range: progress reports to fulfill requirements on military contracts, public relations films, TV clips, etc. Much of the footage is also sent to Wright Patterson Field where it is incorporated into staff reports of the Air Force Systems Command. Other film reports (annual, semi-annual or quarterly) on the progress of specific weapons systems made for showing to Congressional committees, are rather austere documentaries, rigidly factual in treatment, with no music on the sound track. The public relations films,

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by contrast, utilize many feature film techniques. Often a certain engineering group will request footage on a particular research project. This footage is also catalogued in the stock library and many generate a more elaborate full-scale production.

North American's motion picture unit is excellently equipped. It has three Mitchell cameras, one of which is adapted to photograph at speeds up to 200 frames per second; seven Arriflexes, and five Cine-Kodak Specials, plus an extensive array of high-speed cameras such as Milliken, Fairchild, Fastax, Fastair, Eastman, Vought and Photosonic. One of the Mitchell cameras has a full complement of Ektar lenses which were custom-mounted in Mitchell lens mounts at the factory.

The unit's lighting equipment includes 4 Mole Richardson 10kw spots, 12 Seniors, 10 5kw Sky Pans, 12 Juniors and three Mole-Richardson transformer carts which deliver 110-volt current when plugged in to the plant's 440-volt circuit.

Sound Facilities

Because of the sound-proofing problem there is no shooting stage. Lip sync sound and narration are recorded in Hollywood using sound stage facilities of rental studios. However, the unit is fully equipped for finished sound services and dubbing. It has three Magnasync dubbers, a rack-mounted Magnasync recorder, and a Bell & Howell Model 302 Projector—all of which are interlocked by means of Selsyn motors, as is the footage counter. There is a Magnasync portable recorder and four ¼-inch tape recorders, including a transistorized, battery operated Stancil-Hoffman. There is an 8-channel RCA mixing console, various equalizers, filters and a patch bay. Three turntables provide ample facilities for mixing or pre-mixing music. There are also several of the top standard music libraries recorded on tape and disc—the unit having made its arrangements for the payment of royalties on themes used.

Editing facilities are likewise extensive, and include several fully equipped cutting rooms as well as editing desks. Equipment includes two Moviolas—one with two picture heads and two sound heads—the other with one picture head and two sound heads. A great boon to editing is an adaptation worked out by North American engineers to combine a Craig viewer with a sound head connected to an amplifier and speaker. This compact arrangement permits a great deal of sound editing to be done right on the table without having to use a Moviola.

The unit's latest production achievement is a film titled "Operation Hardsite," which has to do with the Zero Launch technique by means of which an aircraft or missile can be catapulted into full flight without the necessity for a runway takeoff. The film, shot at Holloman Air Force Base, New Mexico, shows the shelters that were erected to simulate underground chutes out of which were launched a Martin Mace Missile and a North American F-100 airplane. The film shows graphically how fighter planes and missiles concealed at strategic spots could be made virtually to pop out of the ground and into the air without the use of runways.

The motion picture unit at North American feels very good about this picture; feels, in fact, that it may be a prize winner. And why? Because a cameraman was assigned to cover the Zero Launch operation purely for record. He could have sloughed off, but instead he became interested in the project and set about really covering it. He produced some magnificent footage which generated further enthusiasm at headquarters. This resulted in an appropriation to expand the footage into a full-scale production. It is enthusiasm and integrity of this sort that sparkplugs every film production effort at North American. ■

FILMING DOCUMENTARY

Continued from Page 417

Ciudad Bolivar, but here, again, we met with disappointment. While we were able to buy supplies of food, there was no camping equipment to be had. Finally we obtained a tent from a Capt. Borges, a bush pilot who had been engaged to make daily observation flights over Auyantepuy and report on our progress. He was also to watch for previously-established signals that would indicate requests for supplies, medicine, or other assistance.

When, on the eve of our departure, we checked our supplies and equipment, we realized for the first time that we were setting out on a perilous journey "practically naked!" We had less than a quarter of all the things we needed. We did not even have a gun, because we were unable to wait the one-week's time required to obtain a permit to carry it.

The Expedition Begins

The next day found Ortega and I and our equipment aloft in Capt. Borges' little Cessna plane. He landed us in a hush clearing at the foot of Auyantepuy. To our surprise, we found that the University's expedition had preceded us and already had set up an elaborate base camp, complete with a bar, library, and movie theatre.

We found that the eager group had already started on its quest to reach the mountain top. A trail had been opened part way up the southern wall of the mountain, and a statue of the great Liberator, Simon Bolivar, had been carried up the steep trail and set up on a rocky ledge overlooking the trail to mark the starting point of the University's expedition. But already, the expeditioners were faltering. They refused to go further or to explore the plateau, and seemed no longer interested in locating the lost plane or the headwaters of the falls. In short, they found the going too tough. Thus they had returned to the base camp and many were seen collecting fauna and flora and otherwise having a good time.

As for me, my disappointment was that we had failed to arrive earlier and to have photographed the opening of the trail and the placement of the statue. After some effort, the expeditioners were persuaded to re-enact the whole thing for our cameras. Following this, they turned for home and their Indian guides and helpers gladly followed.

Even my crew, after it had surveyed the jungle and mountain vastness that lay ahead, decided to go no farther. This left only Ortega and myself to continue the journey. It also meant abandoning the Mitchell camera. The retreating University expeditioners left us their food and much of their camping equipment, then bid us goodbye. And for a moment, Paco Ortega and I fully realized how really alone we were and the enormity of the undertaking that lay ahead of us. With some difficulty, we recruited ten reluctant Indians to accompany us and carry our supplies and equipment. While all were good and willing workers, it was the legendary god Canaima and the possible consequences of our invading his territory on the mountain top which filled them with fear. Our friendly

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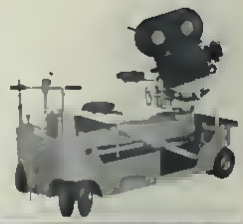

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persuasion finally overcame their fears, for a time at least, and we finally got our show on the road.

It became uncomfortably cold that first night on the mountain, and the next day we signaled Capt. Borges to bring us several blankets—which he did.

A few days later it started to rain. We now suspected that the University explorers had played it smart—saw signs that a rainy spell was about to begin and decided to leave in a hurry. So now we were having it—constant rain (it fell almost steadily for 36 days!). Whenever the downpour ceased temporarily, we got out the cameras and shot what we could. But we had to pass up a lot of things we wanted to shoot, because of the rain and the poor light.

More important, though, was the fact that although Capt. Borges continued his daily flights, we were unable to signal to him because of the overcast. We suddenly realized for the first time that we were totally cut off from the rest of the world—cold, hungry guys desperately trying to move upward and onward to achieve a dubious goal.

On the tenth day we began to run short of food and film. Considerable progress had been made in our ascent

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of the mountain and it was during a rest period that enabled us to more leisurely survey our surroundings that we sighted one object of our quest—the long-lost plane of Jimmy Angel. Overjoyed at our luck, we decided to camp at this point until a break in the weather occurred which would enable us to signal Capt. Borges for food and more film.

And then the real nightmare began. Borges, who had been unable to spot us for days, grew concerned but was unable to fly at a lower altitude which would increase the hazard of crashing into some cloud-shrouded peak. Our food supplies were now exhausted and our Indian helpers were getting "jumpy." That night, six of them deserted us, taking everything they could carry and leaving us only with the cameras and film. They also carried away our dry-ice box in which we stored our film, earlier they had shown a fascination for its brilliant aluminum outer casing. Luckily they had emptied it of the cans of film, which had been carelessly thrown about, but happily none had been opened.

Borges Sends Supplies

We now had left but four Indian helpers to carry our supplies and equipment. Luckily the weather cleared and the sun came out, thus minimizing the possibility that these apparently loyal helpers might revolt and desert us, too. On the first day of clear weather we sighted Capt. Borges and signaled him, and very soon we had badly needed supplies of food and film parachuted to us.

Hit hard by the desertion of the six Indians, we now trusted none of those who remained. Ortega and I took turns nightly maintaining a rigid vigil of our camp and supplies, and to prevent further desertions.

Capt. Borges brought us additional food supplies and 10,000 feet of Eastman Color negative. It was a joyous event for us. However, we did not know that this would be the last we would see of Capt. Borges and his plane for some time. Other misfortunes began to pile up, too. Bad weather set in again, and then we lost the Cineflex camera while crossing a rapids. The Arriflex battery was in need of recharging, so since the Indian helpers were now badly overcargoed, we decided to leave this camera behind. We now moved on with only two spring-motor driven cameras to work with—an Eyemo and a Bolex. It now was raining day and night. Everyone was soaked to the skin, and shooting film became a major problem with a capital "P."

As we labored up the trail leading to the summit of the mountain, two Indians stopped to rest. Too late we discovered that they awaited only the opportunity to desert us—which they did, taking with them a substantial part of our food supplies, one Eyemo camera, and our only set of filters. Things looked pretty bad for us again: we still had two Indian helpers; shooting conditions were extremely bad; we no longer had filters for color correction—and worst of all, we had very little food left. Nevertheless we kept on going—climbing, opening jungle paths, and sometimes shooting with one camera or the other.

The 26th day of our expedition found us entirely without food. But we had reached our goal. We now stood at the headwaters of the mighty Angel Falls! Despite all our hard luck, it was a great day for us and we proceeded to shoot away with the cameras despite the prevailing bad light.

Now our two remaining Indian helpers wanted to start back down the trail. They were hungry, they said, and now that they had seen the falls, which did not excite them too much, they saw no reason to linger there. We, too, were tempted to start back—remembering all the food which we had left at the base camp. But we couldn't leave without photographing the object of our quest—Angel Falls. To return without photographing the falls from various vantage points, would be tantamount to complete failure for our expedition. So we decided to stay, pray for clearing weather, and take our chances without our Indian helpers.

Ate Grass Salads

Luckily, they decided to remain with us. For food, they prepared for us an assortment of salads from various grasses and palm leaves. These concoctions tasted like hell, but we had no alternative. Besides, we still had about a gallon of cooking oil and pound of salt. We made the best of the situation.

When finally the sun came out again, we almost cried for our stolen filters, but there was nothing to do but shoot and hope that the lab would do everything possible to get the best results from our footage of the falls. (And it did. The whole film was processed by Tri-Art color laboratory in New York.)

Weakened from lack of food, we eagerly started our return trip down the mountain. We had left enough food at the base camp to feed a regiment, and the thought of eating good food again gave us courage and buoyed our spirits. Before departing, we left everything behind in the jungle except cameras and film.

As we trudged along the trail, we could hear planes flying back and forth above the clouds. At first we thought it was Capt. Borges continuing his search for us. What we did not know was that the whole of Venezuela was concerned about us. Both private and government planes were conducting an intense aerial search. It was now more than 20 days since Capt. Borges had last contacted us, and he believed that we could not have survived for more than a week on the food he last brought to us.

On the 36th day after leaving the base camp and the University expedition, we returned—weak and hungry—only to find that our deserting Indian helpers had stolen everything we had left at the base. If only we could signal those planes flying overhead, we thought. But the heavy overcast made this impossible. There was nothing left for us to do but settle down and wait out the weather. Several days later the clouds opened up and the sun came out. With the aid of our lenses, we built a small fire and used the smoke to signal the planes. Capt. Borges was the first to spot our signals and quickly came to our rescue, setting his plane down on a small clearing nearby. It was indeed a lucky day for, for this was to be the last day the aerial searchers would hunt for us. The following day we were to be officially declared dead.

We ate Capt. Borges' sandwiches, and two hours later he set us down on the airfield at Ciudad Bolivar. Our expedition—our great nightmare—had finally come to an end. But we were victorious. We had returned with what we had set out for. We had almost died of starvation. But we had brought back with us a unique documentary film of our conquest of the devil's mountain—Auyantepuy. ■

In the first instance where an 8mm sound movie has ever been accepted as evidence by a civil court of law, the Seven Up Company revealed recently they had earlier used Fairchild Camera's new sound-8 movie camera concealed behind a wall of groceries to successfully demonstrate that soft drink customers were confused between 7-UP and a competing soft drink. ■

HAZARDOUS ASSIGNMENT

Continued from Page 409

crew. After stabbing the blind boy the assailants charged down the steps knocking the dress racks over onto the camera operator. Spectators on the sidewalk, attracted by the confusion and not realizing that this was all movie make-believe, took off in pursuit of the boys, stumbling across the equipment and the camera crew. Lindon grasped the camera just in time to save it from total destruction. The desparate actors, aware that they were now being pursued in earnest by a blood-thirsty crowd, ran for their lives. It was a wild scene, both on and off the film.

As the action moved into the building demolition area, the photography became even more catch-as-catch-can. The demolition crew refused to halt its work in deference to the art of the cinema, so the chase continued while mountainous brick and concrete walls came crashing down about the ears of the panting actors, the pursuing policemen and the slightly winded camera crew. Here the entire sequence was filmed with hand-held cameras on the run, newsreel style, in a frantic attempt to record the erratic action before darkness set in and the area would be boarded up permanently.

A tense moment developed during shooting of the sequence depicting the elaborate funeral of the murdered boy. The location selected was the street fronting a church situated in alien territory outside the jurisdiction of the two hired gang leaders. Moreover, one of the gangs, the Horsemen, was on hand with a full quorum of members to act as mourners and pallbearers in the cortege. They were attired in their "dress" uniforms (fedoras, jackets with wild designs on the back and dark glasses). The film company had hired 250 local people to act as extras, but some 2,000 uninvited spectators showed up, and milled and shoved while nervous policemen tried to contain them. On the fringes of the crowd members of the gang which controlled this particular turf glared at the outsiders. For a while it appeared that a king-size "rumble" was in the making—but, fortunately, curiosity about the filming overcame belligerence and shooting proceeded without further incident.

The camera crew had to dodge fly-

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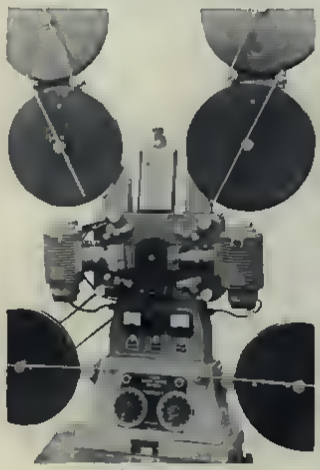

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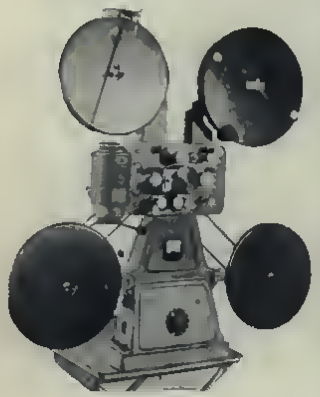

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ing brickbats again, however, during filming of a sequence in which a gang of young hoodlums (paid actors), armed with heavy chains and clubs, ambushes Lancaster on a subway train and beats him severely. Scenes of the action getting on and off the train were to be shot at midnight in a subway station which was also on alien turf. In order to attract as little attention as possible, Linden had decided to shoot the scene with a hand-held Arriflex, using only available light. With his camera concealed, he leaned against a pillar trying to look inconspicuous while the hired gang marched down the subway stairs toward the train, swinging their chains. At that moment the rival gang which controlled that area unexpectedly appeared in force. The gist of their complaint was: "Why should them guys get paid for what we do for nothin'?" Then things started to fly—beer cans, pop bottles, over-ripe produce. Linden busied himself trying to protect his camera. As the situation got out of hand, and with the threat of full-scale mayhem mounting rapidly, the police suggested that the sequence be staged and photographed elsewhere.

Linden pretended he was wrapping up his equipment and started walking with the director and crew to the next subway station. There, he quickly chose a position for shooting and unobstrusively photographed Lancaster as he boarded the train, with the gang piling into the car after him. It was a one-take situation, because the boys kept right on going once they were on the train. The scene of the brutal fight on the subway car was later shot in the studio with precise matching of photographic mood and lighting.

One of the interior sequences shot in New York showed Lancaster entering a tenement of unbelievable squalor, mounting the stairway and visiting one of the gang leaders in his "railroad flat"—so-called because it consisted of a series of rooms (each bulging with a separate family) opening into a common hallway which ran the length of the building terminating at a washroom—the layout somewhat resembling that of a railway car.

Frezzo Lights Used

With a hand-held Arriflex, Linden photographed the stairway scene in a passageway only 26 inches wide while lying on a baggage cart. He was tilted back on the cart by a grip so he could follow Lancaster racing up six flights of stairs (shooting straight up the stairwell). At the conclusion of the shot he was flat on his back on the floor. Lighting for this shot was provided by Frezzo lights—compact, self-contained reflector lamps operated from battery packs. Electricians stationed on the upper floors played the light from these lamps on Lancaster as he mounted the stairs.

The interior of the flat was an obstacle course of tables, chairs, beds and baby cribs — to say nothing of the tenants. There was barely room to squeeze by all of this clutter, let alone find a place for the lights and camera. Finally, through the use of a number of hand-held lamps and baby spots the sequence was filmed. In the action Lancaster walks into the cluttered room, through a set of drapes and into an adjoining bedroom. The part of the set shown up to the drapes in the picture was the actual location. The bedroom, however, was later reproduced as a set at the studio.

Set Plans Revised

For reasons of budget, it had originally been planned to shoot all studio scenes before going on location. Fortunately, however, this decision was reversed. As a result, the company was able to soak up the authentic atmosphere of the locale with all of its grime, misery and confusion. This carried over when they returned to the studio, and sets which had heretofore been considered sufficiently squalid were found to be vastly understated when compared to the real thing. On the basis of photographs made on location, the company's art director revised his sets to conform with the real thing.

A sequence shot in the Fulton Street fish market bordered on sheer bedlam. The company had to wait until tons of fish had been unloaded and transferred from wholesalers to retailers. Then the studio technicians moved into one of the fish stalls and set up to shoot out toward the street in an optimistic attempt to photograph five dialogue scenes. Since this was no studio set-up in front of a convenient process screen, the problem for Linden was to balance the interior light with that of the exterior background. Luckily the walls of the market were painted white, which allowed light to be bounced off of them for fill illumination. The entire sequence was shot with just a few

Junior and baby spots for illumination.

After returning to the studio, great care was taken to match sets and lighting to the footage shot on location. A pool-room sequence, for example, was shot on the stage, and, with the exception of two small incidental lights used as kickers, a practical lamp hanging over the table provided the sole source of illumination. All work lights on the stage were turned off so that even though no ceiling pieces were used, everything above the table lamp went black. This permitted complete freedom of movement for actors and camera. High and low angles were used. When the actors moved into the light they could be seen clearly. When they moved away they were still visible, outlined by the faint fill lamps. The result was a sequence of striking photographic mood.

For Lionel Lindon, the photography of "The Young Savages" marks a complete departure in style from the slick photography of "Around The World in 80 Days," which won him an Academy Award; but it is a comparable achievement and could bring him another "Oscar."

"We started out in our pre-production planning thinking that perhaps a straight documentary type of photography might be appropriate to the subject," Lindon explains. "This would have been comparatively easy to do, but then we decided that this style of photography had been overworked in recent films. We had backgrounds which in themselves were shabby enough, so we decided to accentuate the shabbiness by making the people look good in front of the backgrounds. Straight documentary photography would have made *everything* look bad. Because we felt that the film should have a certain polish to it, we compromised by lighting the sets so that you could see the shoddiness but without making the people look too 'hard.' The result, you might say, is half documentary and half just plain professional photography." ■

LIGHTING SETS FOR TV FILMS

Continued from Page 418

processing. And to be sure of the results, there is no better way than to shoot tests of the emulsion batch. Even with the best instruments for measuring light, incorrectness of readings by a half-stop will often occur, and the new system of calibrating lenses in T stops doesn't help in this regard because it doesn't have any corresponding adjustment in the scale of stops, or foot-candle numbers. In test-shooting I always make note of the number of foot candles of each light; but for establishing exposure the total, or global, amount of foot-candles must be considered.

Knowing all the movements the artists will make in a particular scene, and with all the lights set up according to the mood and effect desired, and with the lights controlled for intensity and balance of contrast, I take the incident light meter again and check the light volume in foot candles for the position of each player—the aim here being to achieve the uniformity established earlier in the test shooting. This procedure is usually repeated: once with only the key light on, and the second time with all the lights on. If any correction is necessary, it is made. For productions other than TV films, I would at this point then let the camera roll. But for a TV film, one additional check is required—otherwise there would be no point in all this theoretical discussion, the object of which is to make clear what I believe to be the manner in which television film photography must differ from that for films produced for other mediums.

Referring to the previous discussion of meters, we would expect that an exposure which is based on the number of foot-candles of illumination would give not only a correct exposure but, if the processing is properly controlled, give a correct reproduction of all the grey tones between black and white. But we are not interested in true-to-original reproduction for the TV screen. We do not intend to keep the human face in its original relationship to the overall brightness of the scene, a relationship which might be about 30 per cent. We intend to shift it up to 65 per cent. To do this we must measure the illumination brightness, using a brightness-reading meter.

In the absence of a meter that measures light in terms of illumination units, we can quite simply convert the "candles per square foot"

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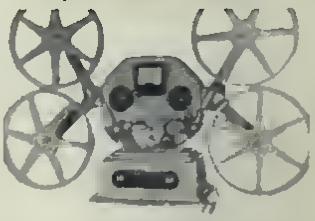

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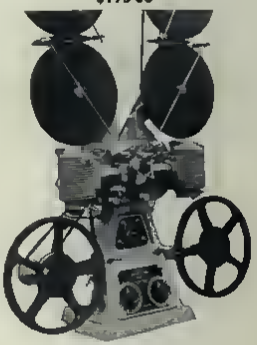

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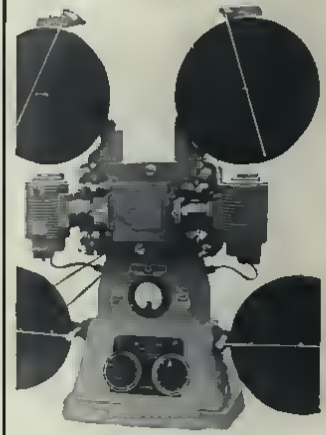

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which we read on the Weston reflected-light meter. According to the manufacturer's instructions, a reading should be taken of a sheet of white blotting paper and multiplied by 4. This renders a reading in so many foot-candles and will be approximately correct, as it is based on the fact that the brightness of an object is the result of the number of foot-candles by percentage of reflectance. And as no white surface would reflect a full 100 per cent of light, the white blotting paper probably represents about 90 per cent of reflectance, which results in the suggested multiplication by 4.

Two Meters Used

Because we are now using two completely different meters and different units of measurement, our calculation of foot-candles into brightness units will only be approximate; but an exact calculation would require precise laboratory instruments and much more detailed work, something a comparatively low-budget production isn't likely to be able to afford. However, I think that calculating between the two meters can be accurate enough in most instances. The meters can be checked by taking readings with them from the 18 percent Kodak neutral grey card, which represents on the dial on the meter the central position for latitude of exposure between black and white. (Not 50 percent of reflectance.) If the incident-light meter at a certain number of foot-candles gives an exposure of F/5, under the same conditions the reflected light meter should show the same exposure.

But our main concern in determining the correct exposure is the artist's face. Because human faces vary, the use of make-up is helpful to bring all the faces to something like the same reflectance. I don't mean heavy make-up which would change the character of the face; most of the time just a brownish powder in different shades is sufficient. As it is usually difficult to continually check the light on artists' faces while they are rehearsing, I used to check it once at the beginning of shooting, or even in test shooting, and then rely on the Lilly, as described earlier. On the Lilly I had two greys: one approximately 40 percent and the other approximately 20 percent, and I found that all average faces would fit somewhere in between. Once my two meters were set up for correct exposure based on the 18 percent grey card, I would put aside the incident-light meter and rely exclusively on brightness. I knew that my exposure would be correct for I was dealing now only with the change of tones within the grey scale. If I had to deal with an exceptional face which was outside the usual range and required a change in exposure, I wouldn't change either the stop or the shutter, but would only adjust the intensity of some lamps in terms of brightness units.

Here is a method I used and found very practical. If, for example, the foot-candles reading on the incident-light meter is 350 P.C, a 30 percent face reading taken from the Lilly showed 32 candles per square foot, which is one unnumbered block on the meter above 25. We are shooting on Kodak Plus X negative, ASA 64-80; shutter 175; F.T. 5. We know that we are working to a range of 16 to 1, or at most, 24 to 1, which represents a maximum of 4½ stops. If there wasn't the TV requirement, we would consider this a central point of the range and have two blocks either side for whites and blacks, but because of the relationships required for television, 32 candles per square foot should correspond to 65 percent of the brightness of the high lights, which would be 50 c.p.s.f. However, we make up for this loss by gaining a greater range in the blacks, down to 2 c.p.s.f. In other words, with 4 blocks on the meter at our disposal, the face should register a little past the third block and the high-lights should not go over the fourth.

There are occasions though, as in closeups, where the highlights are areas as small as a collar or a button, and the deepest shadow may only be part of a tie, or a shadowed part of the hair. Reading such small areas with a Weston meter is impossible. Here, only a meter with a very narrow angle, such as the spot-brightness Spectra, can be of help. By knowing the relationship between the reading in foot-lamberts and candles per square foot, which is approximately 3.2 to 1, we can easily find the limits of our range.

Indoor shooting.

In indoor shooting on location I use essentially the same technique as for setting lights in the studio. But very often in these locations there is day light coming in through windows, or built-in lighting effects, which cause

Continued on Page 440

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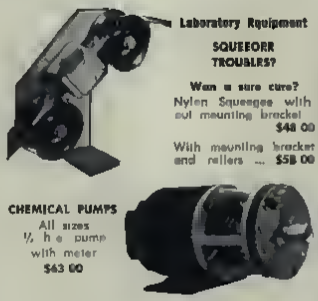

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LIGHTING SETS

Continued from Page 438

serious problems in controlling the range. Windows must be controlled, and devices like neutral-density grey plastic or even simple colored tissue are employed to cut the daylight to the required range. And here a spot-brightness meter again proves its value Very often a small area of window or other opening will let in a strong beam of daylight which can expand the range to as much as 100 to 1.

Inside, the best method is to work with light powerful enough to match the high-lights caused by the intruding daylight. If the shot is not very large, the 24-to-1 range can be set up from the other end, that is, beginning with the window or other daylight effect. However, if this can't be done, and the daylight effect can't be cut down to more than 100 c.p.s.f., then the 65 percent required for the face will fall at 65 c.p.s.f., instead of the 23 c.p.s.f. used in the studio. This will, of course, require much more light and cut down the exposure to F/7 or so, and the limit of the black range will rise to 5 c.p.s.f. This shouldn't bother us too much as long as we don't use real blacks, such as dark costumes Dark uniforms, offices with half-walls of dark wood panelling, dark-brown furniture, are particularly difficult to handle, and when the place is small and already filled with hundreds of other items the situation can become nightmarish for the cameraman However, everything possible must be done to bring the scene within the range, even to the extent of blocking off daylight behind windows or doors with even larger shadowed objects, such as trucks, etc. This requires cooperation from the director.

Exterior shooting.

In exterior shooting we meet all kinds of other problems, but essentially they are of the same nature as those already discussed. Personally I think any kind of weather condition can be made favorable for shooting with the help of booster lights, metal-foil reflectors, shadow-throwing objects, or with specially made nets or diffusers hung over the action. Only occasionally are natural conditions suitable without some sort of rearrangement

For long shots I like having the sun

light coming from one side, but closer to the camera, and having in the background a portion of the sky which can be filtered down with a graduated N.D. filter or a straight orange or yellow filter. For closer shots I avoid using orange or other dark filters which may alter the balance of lighting for the face—especially when make-up is used.

While placing artists against the sun can create a brilliant effect as a result of the back or rim light the sun provides, it makes necessary boosting the front light by using either strong artificial light units, such as 5-K's, or silver reflectors. With artists positioned thus, the sky area in the scene will also require special attention.

Whatever the location, the light conditions and the dramatic factors present in the script, the photographic problem invariably is the same. The range must be kept to a maximum of 24-to-1 and the face or principal object of interest must be 35 per cent less bright than the brightest area or highlight in the scene.

As for the choice of exposure meter, I believe that only a meter that registers the light in terms of brightness units should be used. For this I recommend the Weston, which I used on the "Heritage" series, because the meter's scale is clearly divided into blocks, both numbered and unnumbered, which makes it possible to determine the required range without having to make complicated calculations. ■

FILM ON SOLDERING

Continued from Page 413

the melting and color change in the solder as it cools and hardens, are dramatically portrayed. Wrong procedures and their consequences are also delineated so that the viewer can see what happens to a badly soldered joint and understand why the component will fail.

The extreme closeup photography, contrary to the belief of many cameramen who have viewed the film and inquired about it, is straightforward photography done without the aid of a microscope, or optical printing, etc. All of the ultra-closeups were made in the camera—no tricks of any kind were employed. Plus-½ and plus-1 diopter lenses were positioned in front of the Pan Cinor zoom lens so that zooms covering an area of about one and one-half inches wide could be filmed with the lens in telephoto position. The standard Arri extension tube was used with the 50mm lens to photograph an area about one-half inch wide. Since the 50mm lens employed with the tube resulted in approximately a four inch focal length, an area about the size of one 16mm frame was covered. This required an additional two stops exposure, so the area was illuminated with an f/16 light to allow filming at f/8. No increase in exposure was required when the zoom lens was used with diopter lenses since the zoom itself was not extended. Three- and four-inch lenses were also used with an extension tube when larger areas were to be covered. The Arriflex's through-the-lens, parallax-free framing and focusing feature greatly simplified the work. A Miller fluid head also aided in "sneaking" a slight pan or tilt whenever required on zoom shots, so that the soldering area was always precisely framed.

In some cases, at director Hagerthy's command to "move in closer!" the extension tube was unlocked and pulled out of the camera socket, i.e., extended further, to permit working still closer for greater magnification. This is a rather unorthodox technique and is not recommended unless employed with great care. The least vibration encountered when using the lens in an unlocked mount may result in out-of-focus pictures; also, there is always the possibility that the unsecured lens may fall out of the camera! For this reason it is advisable to tape the extension tube to the camera lens socket and hold it firmly while shooting is in progress. For us, this im-

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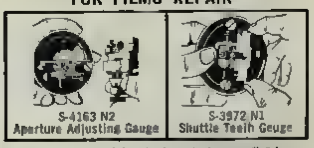

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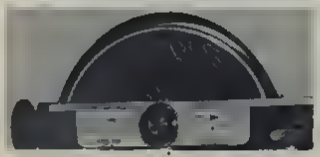
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FILM ON SOLDERING

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provised technique saved the day and delivered the extreme closeups which tell the solder story so dramatically.

While the extremely close positioning of the camera and lighting introduced little difficulty, a number of physical problems arose because the actual soldering had to be accomplished with the technician's arms wrapped around the tripod legs. Placing the lens at his eye-level, for a subjective point-of-view camera angle, often partially obscured the work from the technician's view. What we needed was a soldering expert with a cavity in his chest and an extended eyeball! That the soldering is technically perfect is a tribute to Chuck Meier, Electronic Production Engineer of Temec, Inc., who did all of the soldering shown in the film under conditions that were almost impossible. Obviously it was vitally important that every shot of the soldering procedure be absolutely perfet because of the fantastically large screen magnification. A number of retakes were necessary for purely technical reasons since a slight jar or inadvertent movement of the technician's hands or the erratic behavior of the solder itself detracted from the high quality rendition we set out to achieve.

A tilting vise was employed to hold the object being soldered so that it could be slanted in a "square-on" position with respect to the lens and thus take every advantage of the shallow depth of field available in such close filming. Illumination was furnished by PAR 38 flood bulbs mounted in Gator-grips and operated through ColorTran converters. The f/16 light level concentrated on so small an area resulted in such intense heat on technician Chuck Meier's hands that they had to be kept wrapped in wet towels to prevent burning them. At one point he complained that his hair was on fire! (The heat from the lights actually singed it.)

The heat from the lights (often over 300°), also caused soldering problems because heat plays an important part in soldering, which is a metallurgical solvent action. Sometimes the rosin would flow out of the solder core, or the solder itself would melt before it was applied. The extremely limited field of view, intense lighting, cramped camera set-ups, shallow depth of field, high magnification and the physical limitations imposed upon Chuck Meier, who had to do perfect soldering under the greatest handicaps, all added up to a series of rather hectic shooting sessions. That the picture was photographed at all is due to the patience of all concerned, rather than any tricky techniques. Often a camera set-up that took ten minutes to line up and light would be accidentally jarred by one of us and go completely out of focus. We literally held our collective breath while filming was in progress.

Neither Ron Hagerthy nor I regarded this assignment as particularly difficult, and the picture was shot without a single camera test having been made. We were more concerned with recording technically perfect scenes from a soldering, rather than a camera, viewpoint. I feel rather apologetic in describing our so-called "trick" photography since no tricks were employed and no secrets were involved in shooting the extreme closeups. (The techniques employed are all described in my article titled "Extreme Closeup Cinematography" in the *American Cinematographer Manual*, beginning on page 187.)

Due credit should be given to Claude Michael, Inc., sponsor of the film, for recognizing the need, and providing the funds for the project without injecting advertising of any kind, except for an occasional glimpse of their product during the natural course of the soldering procedures depicted in the film. Both Ron Hagerthy and I would like to thank Mr. Michael for *not helping us!* He did what we think all film sponsors should do: okay the script and the budget and pay for the work. That he had enough confidence in our combined ability to do the job as we saw fit is a tribute to his courage and understanding.

Production heads, electronic engineers and visual training personnel throughout the United States and Canada have reported that use of "On Solder" to train new technicians and to enthuse experienced workers has contributed toward a definite up-grading in soldering techniques and resulted in more reliable production. Thanks to these accolades and to the awards tendered the film thus far, an enlarged film program is planned, involving a series of similar subjects to be produced in the near future by Claude Michael, Inc. ■

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